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FIRST AID TO THE INEXPERIENCED—V

Social Values, Co-operative Work, and Group Problems

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THE whole tendency of manual training, as well as of other school subjects, has been to emphasize the purely personal values of the work. It has been individualistic to an exaggerated degree at the very time when social considerations in all other realms have been pressing for attention. High sounding precepts concerning matters of social and moral conduct have never been wanting in the school. They have adjured the rising generations to love their neighbors, to bear one another's burdens, to do good to those that despitefully used them, etc., etc., but in *practice*, there seems to have been something of the eye-and-tooth philosophy. In school, it has been an unpardonable sin to "study together", and if a boy undertook to "help his neighbor", he was promptly and emphatically reminded of "his own business."

From the beginning of manual training to very recent times, the reasons advanced in support of such work have been, almost wholly, selfish ones; reasons that were based upon the assumption that there is an inherent antagonism between the individual and society, and that it is the business of the individual to beat the game somehow by looking strictly after number one. The whole category of values attributed to early manual training consisted of such claims as "forms habits of neatness", "makes one a keen observer", "gives self-reliance", "gives one greater power to grapple with the world", etc., which, in the spirit of the times, were regarded as personal attributes quite apart from any social significance or obligation.

To be sure, all of the other subjects of the curriculum have been greater transgressors along this line than the manual and industrial arts. From time out of mind, education has been regarded as a kind of process by which to escape certain of the obligations of society, especially those of doing its work and bearing certain of its burdens. It is only comparatively recent that education has been thought to entail added obligations and that the acquiring of greater ability for service implied the assumption of the responsibility for rendering greater service. "Education for service" is an exceedingly new and startlingly revolutionary notion. Indeed education was supposed to be for the "harmonious development of all of one's faculties", for the "disciplining of the mind", or for "culture." It assumed the separation of the individual from society and set itself resolutely to the task of turning out good, cultured, self-centered individuals with a kind of general intelligence, in the hope that they would so relate themselves to society as to get from it whatever was needful to further their own purposes and welfare.

The modern notion is to remove the conflict between the individual and society *by making each individual a conscious and efficient part of society and by rendering society the means whereby the individual may realize his highest hopes.* The interest of a society or a state which is the embodiment of all the desirable qualities of the individual certainly could not be in conflict with the ultimate good of the individual.

The sentiment is rapidly crystalizing to the effect that whatever is good for society as a whole cannot, in the very nature of things, be *bad* for the individual. It has frequently been said that "society has rights which the individual must not ignore." It is, of course, *best* for the individual to accord society its rights, for in so doing, he makes it possible for society in turn to accord to him the richer and more wholesome privileges of the individual member.

In the final analysis, the ultimate end of society is found in the enrichments of life which the interplay of the individual and the common rights, privileges, and obligations brings to its individual members. Hence, when one intelligently speaks of the rights and privileges of the individual, one does so with the conscious qualification of society's rights and privileges and their reflex upon those of the individual. Therefore, both the individual and society profit by *any real and genuine good* which comes to either. In the old education where only the good of the individual was sought, the results belied the specious theories of the schools. There seems to be no place in the modern

world for the person who is *only an individual*. Hence, the modern educational theory lays great stress upon the cooperative enterprises and social bearing of all the work of the school. Herein lie many opportunities for moral training and for the development of moral habits, for it is in cooperative enterprises and in social relations that moral situations arise. I am disposed to wonder sometimes just how far the old, selfish, egotistic, non-social education is responsible for the present distressful strife and lack of the cooperative spirit in the business and industrial world.

Progressive teachers of manual training have long recognized the desirability of this element of cooperation and social interdependence in their work. The prevalence of the practice of using articles needed in the home as problems for the manual training classes is due in no small measure to this consideration. For it has long been conceived that when a boy makes an article for the home or for members of the family, he is rendering a comparatively unselfish service and is thus performing a deed of social and moral significance. Altho not free from selfish, narrow interests, such work makes a start in the right direction and is undoubtedly a valuable training in wholesome regard for others' welfare and happiness. The present demand is that such interests and training be widened and enriched until they shall include the whole of society and develop the proper attitude toward it.

The value of cooperation or team work, where each man is an essential but inconspicuous part of an organized movement, has just been impressed upon us these last years by our experiences in the war. Every person who wore a uniform knows now what it means to leave the individual, gainful pursuits, to put aside the liberties and the pleasures of the individual citizen, and thru the long months of intensive preparation to submerge one's self in the common good and to be forged into a weapon for the defense of society. Every such person has grasped the far-reaching principle of the inter-relations of the rights and privileges of the individual and of society. Every ex-service man has had it borne in upon him in an unforgettable way that no *individual is safe where* society as a whole is endangered. Hence, the time is ripe and the soil is fertile for the spreading of the gospel that living together is a difficult and a cooperative enterprise, and that he who receives protection and privileges from the general public must expect in return to render service as for value received.

The social value sought in the manual and industrial arts have a marked and a very practical influence on the character and purpose of the objects to be made, the methods of cooperative or group work, and the spirit with which the work is undertaken. There may be mentioned three different divisions of the field of school work looking toward social training and the larger aspects which are being emphasized in modern education.

1. *Work based upon the usual individual problem but for philanthropic or altruistic purposes.* Such work, of course, includes the ordinary home projects but is infinitely richer and more comprehensive than this limited group. A notable example of this highly important kind of work is the toy shop, or Santa Claus shop, idea now becoming so general. Broken and used toys are collected from all over the community, and are repaired, refinished, and given out thru philanthropic agencies to the unfortunate children of the community. Of course, the work does not stop at simply repairing toys; great quantities of new toys are made and distributed with the old ones. Even if the individual problem method is used thruout, it is still much more unselfish and much higher in moral quality than the individual's efforts for his own personal satisfaction, or even for the comfort of his home. But such work is susceptible of a high degree of organization under the group method which will be discussed under another topic.

In this same category should be placed such undertakings as the making of scrap books, or other useful and interesting books, by pupils actuated by kindly impulses to do such deeds for those children, especially of the great cities, who are less fortunate than themselves. A number of schools are making an annual offering of such products for distribution by active and responsible social workers or societies. Each book is accompanied by a letter written by the maker of the book and bearing a message of cheer to the recipient. These letters usually bring interesting replies. Such an exchange has in it great possibilities for the inculcation of fellow feeling and appreciation.

The same high purpose sanctified by a patriotic ardor inspired the school work that was done for the Red Cross, the Y. M. C. A., and other humanitarian agencies.

In some cities, notably St. Paul and Cincinnati, as well as in numerous smaller places, the making of great quantities of bird houses during the late winter and early spring months has become an annual enterprise of great importance. The houses are used as individual projects and are not standardized except in certain fundamental considerations like cubical contents, entrances, etc. Exhibits held in central locations and the houses are offered for sale. Large sums are realized from such sales and are used for the furtherance of other school or community projects. The organization for the exhibit, for the sales, and other activities necessitated by such undertakings, is most complete and affords abundant opportunity for pupils to cooperate in large community affairs; but the actual constructive shopwork is on the individual basis. Such undertakings, which cultivate the spirit of consideration and care for bird life and at the same time foster an unselfish devotion to needs and interests of the community, are valuable training in social responsibility and obligation.

In all these enterprises where the worker works alone on an individual problem, for an unselfish purpose, the attitude is good, the spirit is wholesome, and the social value cannot be overestimated. Yet in it all, the individual remains separated, in a measure, from the group, and fails to acquire that desirable quality of being able to work as one of an organization, so necessary in an effective member of society.

2. *Work done for the individual but by the cooperative, or commercial method.* The value of this type of work from the social standpoint, lies wholly in the method of its performance. It requires the harmonious and efficient cooperation of a group of individuals in the achievement of a common purpose. The social value of the work in the first case mentioned above is in its altruistic nature, in the willingness on the part of the individual to put forth an effort for the common good. In this second division, it is the accomplishment of an end vital to the individual thru the cooperative and interdependent efforts of the group, that lends social significance to the enterprise.

To illustrate this method, let us assume that a desk chair has been selected as the class problem. If there are twenty members of the class, there are twenty chairs to be made. By discussion, investigation, and conference, a certain type of chair is designed or agreed upon. This, of course, like all community efforts, must be a compromise. The individual ideas must yield to the composite one, even in this type of work where the product is for the individual. The actual work of construction is so organized that each individual or sub-group performs a certain specified part of the work on all of the articles. Under certain conditions, the individuals or sub-groups may alternate at the tasks so that each may have a variety of processes to perform. But when the articles are completed, every worker has actually done as much work on each of the other nineteen articles as on the one which finally becomes his own.

By such an arrangement, advantage is taken of the organizing talent of the class and the disposition of a group to organize themselves. The discriminating teacher will already have discovered the leadership and the organizing geniuses of the group by observing those free-for-all games of base ball, foot ball, and other sports in vacant lots, after school hours and on Saturdays. That unfailing prescience of the group in eliminating all but the essential considerations when the leadership and control of the group are involved, furnishes an unerring guide to the teacher in the selection of foremen.

3. *Work done for the community or for general social or philanthropic purposes by the cooperative method.* This type of work involves the essentials of the other two. It combines the motive of the one with the method of the other. It includes all those various constructive undertakings prompted by unselfish motives, that are organized on any sort of production or cooperative basis.

The commonest form of this type of work is such as is done for the school. This ranges from the simplest repairs of buildings and equipment to the construction of elaborate furnishings and equipment for office, library, shops, kitchens, and even to the erection of buildings for school or other community purposes. There are a few well known high schools where the purely individual project is not used and where the entire product of the shops is for the use of the school system.

Under this method of procedure, the class is organized somewhat on the factory basis with a foreman for each special group. The jobs are routed thru the shop, so that the work of each group is specialized. Of course, the groups are shifted frequently enough to give each individual some experience with the various machines, tools, and processes.

Certain classes of the repair work of a school system, when taken out of the realm of drudgery and chores and properly organized, supervised, and conducted, furnish some very desirable experiences and some excellent opportunities for a service that touches the entire community and reacts in a very wholesome way upon the individual. The hope of this kind of results precludes any scheme that would send an individual or group out with the janitor on indiscriminate and unclassified jobs. The social aspects of the work must be only one phase of it. There are other purposes of training and instruction which it must meet. It must therefore be fully organized and conducted by a trained and skillful teacher, who can use such service and experience in his further plans for the work and training of the class.

As was indicated in a previous paragraph, the work of the toy, or Santa Claus, shop may be organized to a very great advantage on the plan of this third type of procedure. One group of workmen with its foreman is assigned to the task of classifying the toys in need of repair and of indicating on a card for that purpose the exact operations to be performed on each toy. A similar group is appointed to make new parts for the broken toys according to the specifications of the first group. Another group does such repairing as regluing of articles, gluing broken parts not requiring new pieces, and similar operations. A small, special group is often necessary for the making and repair of metal parts. Still another group assembles the parts and attaches them wherever they are needed to restore the toys. Finally, a group takes charge of the painting and other finishing processes necessary to the completion of the work.

In the department of new toys, the work can be much more accurately classified, the tasks can be more definitely assigned, and the work can be carried forward with greater certainty and dispatch than in the repair department. However, in the case of the repaired toys, the workers in the manual training shops stand between two large groups of people—those who

donate the toys and those who finally receive them—thus joining together considerable numbers of people, frequently from the very extremes of the social scale, in one common effort to carry happiness into as many lives and homes as possible.

The Printshop as an Example.

Printing is the ideal socializer. It lends itself perfectly to the group or cooperative method of procedure. Indeed the very nature of printing almost necessitates such a method. It makes its strongest appeal to the sense of social needs, and satisfies the individual's highest ambition to serve the larger group.

Teachers of printing have been surprised at the small demand on the part of the boys for the purely personal, individual jobs. A boy manifests but little interest in the printing of a page of material for his own personal use and satisfaction; but to print a thousand programs or school papers for distribution in the school or in the community enlists the deepest interest and the warmest enthusiasm, and commands the highest skill of which he is capable. Such enterprises enlist the whole force of public appreciation as incentive to the boys' work, and they likewise hold up the possibility of public censure for slovenly work. For it is a fact in this type of work that all must suffer for the inaccuracy, carelessness, or inefficiency of each individual. Hence, all the members of the class are vitally interested in the success of each individual, and this interest exerts a powerful and wholesome influence upon those members of the class least disposed to do a high grade of work.

So far as the community which a school paper serves is concerned, the responsibility and the censure for errors, indiscretions, etc., falls upon the whole class group. But the class passes the criticism on, intensified and sharpened by the personal touch, to the individual directly accountable for the defects. Thus the whole atmosphere of the school printshop is one of scrupulous attention to all the details, from copy to finished product, that go to make up a school paper or other important job of wide circulation. It is no uncommon sight to see a member of the printing class come rushing into the press room, frantically waving a copy of the paper just coming from the press, and peremptorily demanding that the press be stopped for the correction of an inverted letter or a misspelled word. One of the most careless and irresponsible boys I have ever known created something of a sensation and a considerable disturbance by refusing to distribute a school paper which contained an inverted "e" and by demanding a reprint of the entire issue. He said that he didn't "propose to have his name all mussed up in a job at which the whole town would be laughing!" Thus the consciousness of the fact that the interest and the pleasure of a large group of people are dependent upon the efforts of a certain class and eventually upon the individuals of the class tends to hold the individual up to his highest and best work. Finally this interplay of the rights and needs and pleasure of society with those of the individual results in an attitude on the part of the individual that is not satisfied with the mere selfish enjoyment of privileges that compromise or destroy the privileges of the group. Hence it produces the *socialized individual*, a worthy accomplishment of any scheme of education.

One of the easiest ways of handling the group or community work, especially in the grammar school, is to combine it with the preparations for the celebration of certain days or occasions about which certain well established customs have grown. Thanksgiving, Christmas, Washington's birthday, Lincoln's birthday, etc., are examples of such occasions as offer abundant opportunity for cooperative effort in a common enterprise. There is, of course, this difficulty, that the work for special day celebrations is for the most part temporary and is of such character as to require its being done in a very limited time, but it has sufficient merit from other points of view than that of technical construction to make it very much worth while.

Much more also can be done than has thus far been thought possible or desirable in the way of work by the upper grades for the pleasure and assistance of the lower grades. Here is an opportunity for genuine cooperation. It is not a rare occurrence for the grammar grade boys to build doll houses or playground apparatus or sand tables for children of the lower grades. When properly understood, planned, and conducted, such work always proves to be exceedingly interesting and profitable to all concerned.

The teachers of household economics are developing plans for work that is not confined to the satisfaction of purely individual desires. In fact, courses in cooking have but little significance, if you take away the social aspects. There is not the great incentive after all, (as it may seem to a boy) for a girl to labor patiently and long to prepare some mysterious recipe and then to face simply the doubtful pleasure of eating her own product alone. But when she pursues the modern idea of the preparation and serving of a meal to which she may invite her friends, she is satisfying a much larger need and is receiving instruction along much broader lines than if she followed the simple impulse of personal want. And when she joins with others of the class to prepare and serve certain menus to school or other groups, she enters a highly socialized form of service very different from what she would perform as an individual working alone over a recipe for personal satisfaction or profit.

There are many instances where schools, thru the household economics departments, conduct lunch rooms or cafeterias. In such enterprises, the planning, the menus, the purchasing, the cooking, the serving, and the accounting are all in the hands of the pupils and students, organized and managed, of course, by the teachers. There are, of course, in such undertakings certain defects and objections and dangers, but they un-

doubtedly bring the elements of reality into the work and provide helpful training in cooperative effort on a considerable scale.

Girls' classes in sewing are usually limited to a very narrow field of individual work. But when a class undertakes to clothe a group of children in a neighboring orphanage, the problem is immediately transformed into one of wider sympathies, more varied work, and larger possibilities.

Individual Projects Necessary.

It must not be understood from the emphasis here placed upon the idea of community effort that the individual problem is to be discarded. It will probably always and rightfully occupy a prominent place in the work of pupils, especially of the grammar school. The individual project furnishes a means of reaching the fundamental interests of pupils for the purpose of influencing them. Teaching is influencing, and the teacher must build upon what he finds in the pupils. The selfish impulses are the more primitive. Social interests and demands come later in the lives of people. Selfish desires are instinctive; social desires and obligations are acquired and assumed. Hence community interests are a slow growth and must be cultivated, and probably the best means of cultivating them is to intermingle them with the individual interests and the sense of personal needs.

This discussion is offered from the viewpoint of the more or less elementary work which is given without vocational intent. Its purpose has been to point out the weakness of the schools on the side of community of effort, to indicate certain principles of procedure in the attempt to remedy the weakness, and to suggest types of work that have proved satisfactory for organization and use in the cooperative work of the schools. As was mentioned before, this work is not urged to the exclusion of the individual project. It simply emphasizes the need of a varied program that will include the group problems.

The three types of work dealt with in this article meet the following demands that have become insistent in modern education:

1. They cultivate a considerate and responsive attitude toward the needs and rights of others.
2. They exemplify the method by which the individual profits by the pooling of common interests and efforts.
3. They bring to the individual the satisfaction of having done worthy deeds for the common good.
4. They give a sense of and a basis for estimating property values and the values of productive labor.
5. They furnish experiences that give some appreciation of the methods of modern industry.
6. They discover, develop, and guide certain types of leadership that are needed in community life.

THE PUNCH PRESS AS A SHOP PROBLEM

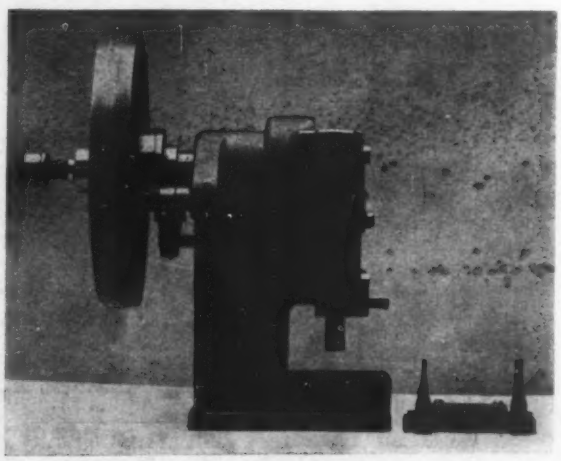
John H. Faust, Machine Shop Instructor, Mt. Vernon, N. Y.

THE punch press, as illustrated, is a very interesting and useful problem. The exercises and varieties of work give the boy an opportunity which he probably would not appreciate were he doing some other class of work. The building up, fitting the parts, then starting under power, keep him constantly interested. It is then necessary to make the punches and dies for the various types of blanks. This being done and the machine in operation, the instructor will find the need for more work of this kind.

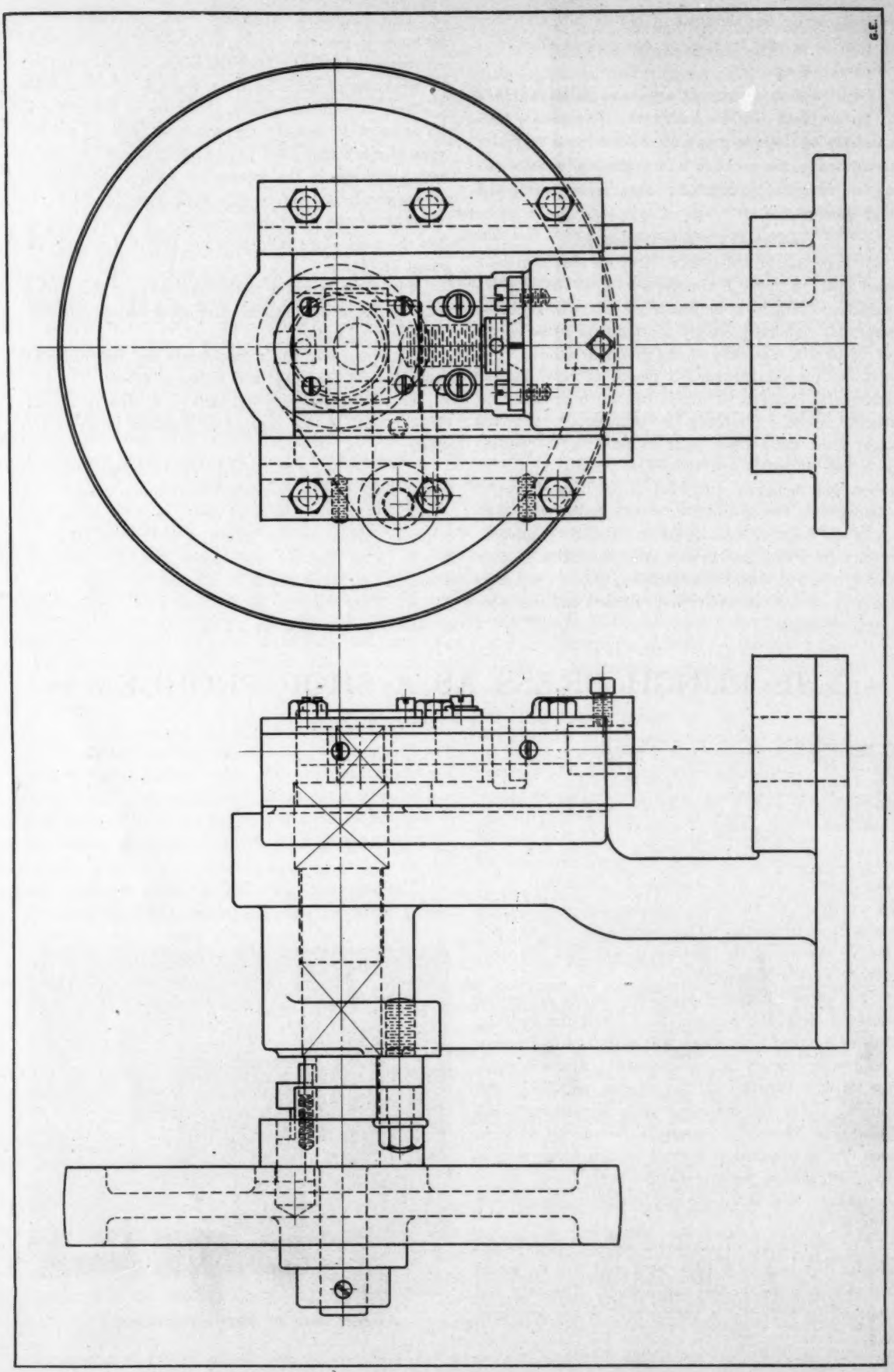
The press illustrated was built at the School of Industrial Arts, Mt. Vernon, N. Y., and the building of one of a larger type, which will permit us to do work of a greater variety is contemplated. On the small press we have punched out key checks, tool checks and washers. Other dies are being made for different sizes of washers. There is no limit to the amount of work which can be punched or formed on this press, such as stars, half moons, electric fixture parts, etc. All of these things help to arouse and maintain the interest of the boys.

The machining of the press and its parts is not difficult, requiring very little skill and will be found a suitable problem for the school shop. The body can be shaped or milled if a boring mill is not available. The boring can be done on the milling machine by the use of a boring bar. The lathe work is simple, requiring no large machine to turn the parts. The flywheel is nine inches in diameter and can be turned upon a 10″ lathe or upon a 12″ lathe, when chucking the casting.

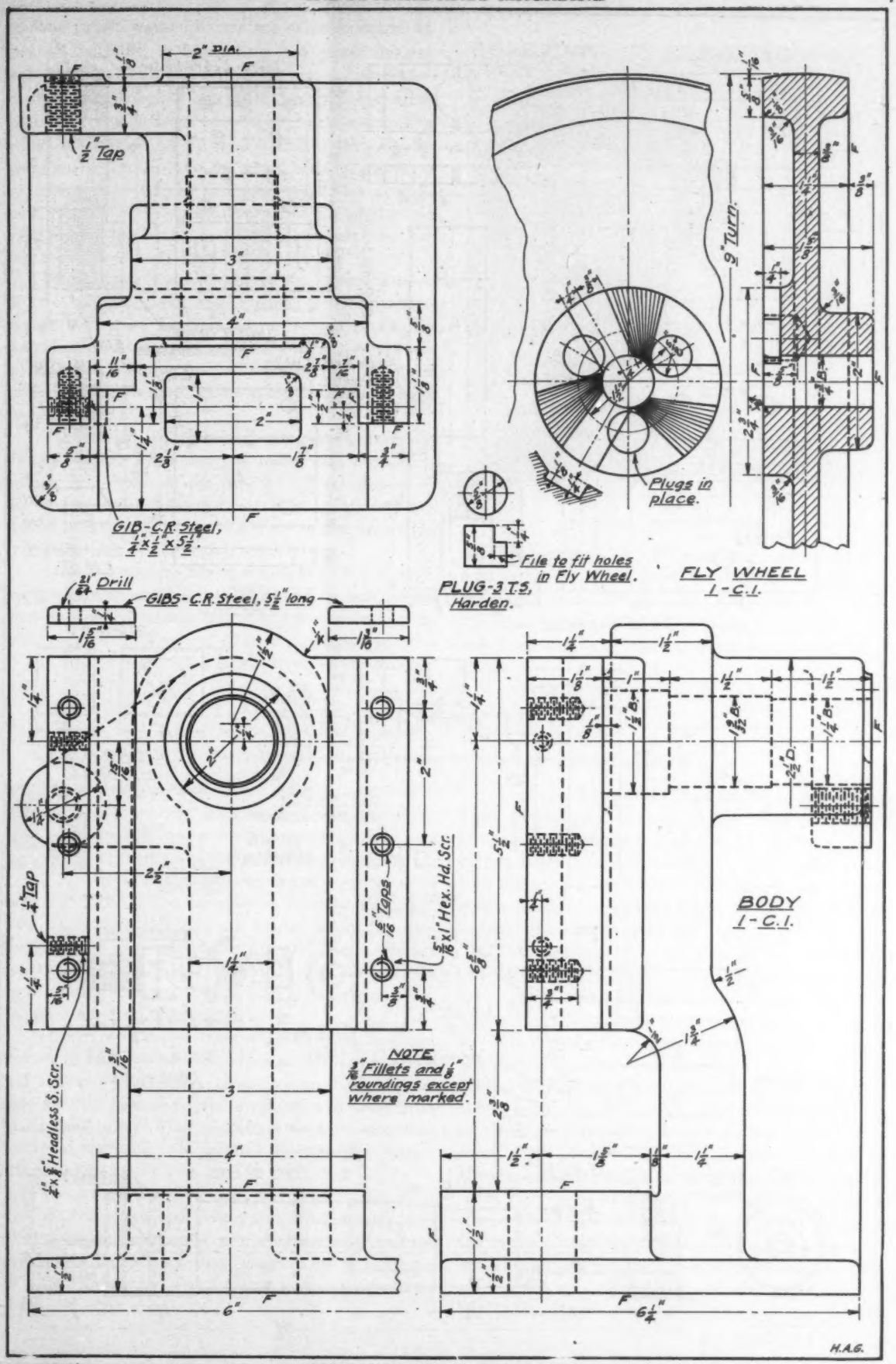
The eccentric shaft will probably be found the most difficult for the boy to master. This, however, can



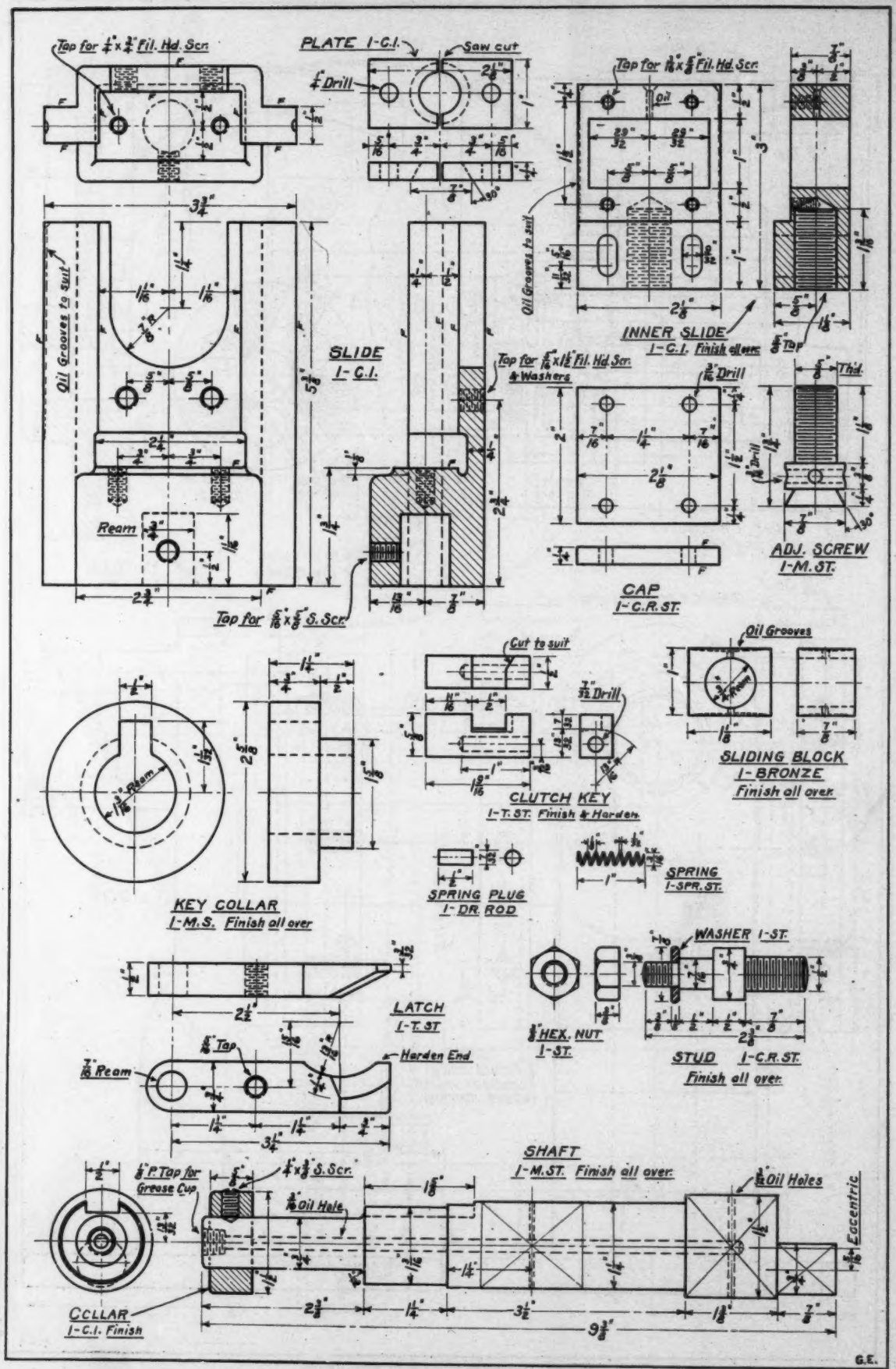
SIDE VIEW OF THE PUNCH PRESS.



ASSEMBLY DRAWING OF PUNCH PRESS.



DETAIL DRAWINGS OF PUNCH PRESS.



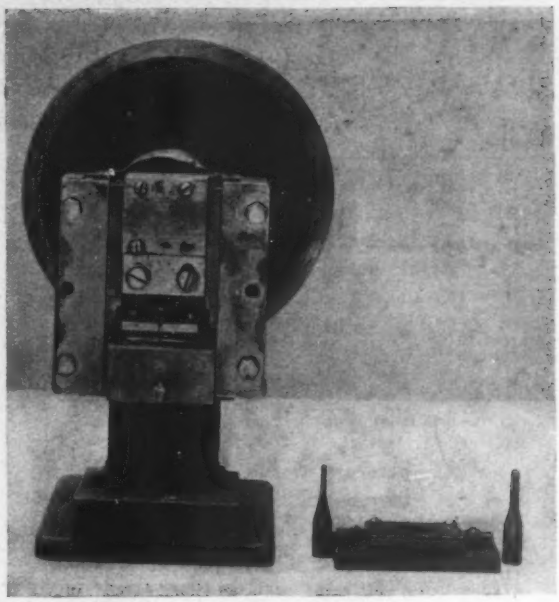
DETAIL DRAWINGS OF PUNCH PRESS.

be done in two ways: By the use of an eccentric fixture on the lathe, or by drilling both center holes in each end before turning. A certain amount can be left at the flywheel end of the shaft, which is turned off when the rest is finished, (one-eighth to three-sixteenths being sufficient). An oil hole is drilled thru the fly wheel end of the shaft to the wheel bearing, which can be lubricated by oil cup or grease cup. This arrangement eliminates the necessity of throwing off the belt, when oiling the shaft, as would have been the case had the oil hole been drilled in the wheel.

When fitting the latch, great care must be taken to avoid slipping over, or the punch will continue to operate. It must be fitted so as to stop at the top center and must be tried repeatedly until the maker is satisfied that slipping over will not occur. The latch and clutch pin are then hardened and tempered to avoid excessive wear.

The rest of the parts are very simple, excepting the inner slide which may be made with a specially formed tool on the shaper if a slotting attachment on the milling machine is not available. This tool can also be used when finishing off the seat on the main slide, or mandrel, for the adjusting screw plate.

After the machine has been completed and is working properly, it can be set up on a bench or table, where there is power overhead, fastened to the same, and the tread rod and treadle fitted so as to permit the tripping of the latch by foot. This is not shown on the drawing but can be rigged up very easily. A spring must be used to bring the treadle up very quickly so as to keep the punch from coming down a second time.



FRONT VIEW OF PRESS.

Punches and dies can be easily and quickly made and form useful and interesting problems for the school shop.

SHOP EFFICIENCY

Edmund Hanley, Hackley Manual Training School, Muskegon, Mich.

LARGE sums of money are spent annually to instruct boys and girls in the use of tools, to develop their power to construct, and to gain a general idea of the various trades, but little is said or done as to the preparation of boys and girls to become efficient business managers. The students at this age are exactly ready for such training, and it is universally accepted that a teacher can do more with some children in this direction in such training in a few months than some parents could do with the same child in years.

If we are to expect more efficient young men and women in later years, well versed in business methods and endowed with thrifty habits, we must begin while they are still boys and girls to educate and train them along these lines. What place have we with conditions better to carry on this training than in the present school system?

The writer desires to take the reader for a little visit into his school shop where an effort has been made to give the boy an insight into shop methods, and the problems with which the business man has to deal, and to actually allow the boys to carry on quite extensively some real shop system.

The first thing that I require from my students upon organization of classes is a complete card record of their classes and room numbers, or rather a record of just where I can get hold of any certain boy at any time during the day should I need him. A list of telephone numbers and street addresses is also advisable to have on record.

The cards are then all arranged in alphabetical order and numbered, which gives the boy a serial number. This number he uses for tool checks, plane bits, locker, etc. Benches are then assigned and a complete schedule is made out for each bench and that schedule attached in some convenient place close to the particular bench. Should tools be missing, or should the bench be out of order, the incoming student can see at a glance just who the responsible person was and report him at once to the clerk. Class lists are then arranged in alphabetical order and a list is made out with specified dates, showing just the week that each boy will be in charge of the tool room and supplies, and will assume the duties of clerk for the class.

During the first week, the boys are assembled and given a talk on shop methods and shop system, and the application of such a system to the school shop. A plea

is made to all the students for cooperation, in endeavoring to make the place as shoplike as possible. The discussion includes:

1. The tool room, the clerk and his duties.
2. Tool checks, contracts, assuming responsibilities, loan of keys.
3. Equipment, tools and their proper places
   (a) Care of tools
   (b) The tool certificate
4. Buying lumber from the schools
   (a) The shop ticket
   (b) The mill bill
5. Shop order card
   (a) Its place on the shop bench
   (b) Its value to the instructor
   (c) Its value to the student
   (1) Record of work on an open file
   (2) Issuing orders
   (3) Figuring shop costs
6. The use of the bulletin board.
7. Taking care of the lathes, reservations, etc.

The Tool Room.

To properly carry out an organized and efficient system in the shop, it is first necessary to install, in some form or another, a tool room or "crib." It should be well planned, taking into consideration the following:

1. Convenience to and from the benches.
2. Occupying the space least needed.
3. Adjoining closet space where possible.
4. Best light for both night and day.
5. Ventilation, heat, avoiding drafts.
6. Wall space.
   (a) Tools arranged to save space.
   (b) Tools grouped: screw drivers, hammers, calipers, braces, etc.; the various turning tools in groups.
   (c) Bins for certain tools: Scrapers, files, bits, etc.
   (d) All tools numbered; corresponding numbers on the wall.
   (e) Bins for supplies. Stock for standard projects, sandpaper, brads, screws, finishing materials, etc.
   (f) A small bench for the clerk; a card file.
   (g) A rack for unused checks.
   (h) A file for blue prints, drawings, suggestions.

Tool Checks.

A limited number of brass checks are loaned the students for use during the semester. (If the authorities feel that the brass checks are too much of an investment financially, a small cardboard, metal bound, such as is used for price tags in department stores, can be used very satisfactorily, and is inexpensive). The boy assumes responsibility for these checks by signing a contract which he secures from the clerk in the tool room. After signing, the clerk places the contract in the file. The boy has then offered to the school his yearly credit as security for the loan of the checks. The boy must be warned never to take the checks out of the room, but to leave them close at hand in some convenient rack. I have found it to be a most common practice among instructors to have the check rack in the tool room. This, I believe, is not practical nor is it fair to the boy in charge where the class has the opportunity at large to merely drop their tools at the counter, call out their number and run. All of this is avoided where the boy has to wait to receive his checks before leaving the crib. If you will read over the contract (Fig. 1), you will notice that in signing the contract, the student is also made to bear and to feel a little more responsibility for the care of the equipment and for his own deportment.

HACKLEY MANUAL T. S. PATTERN SHOP
E. C. HANLEY INSTRUCTOR
STUDENTS PLEDGE CARD 65

In receiving these 7 Brass Checks I do so upon the following conditions: that I shall not receive any credit or marks in the Pattern Making Department until I have returned to the instructor the entire 7 checks. For each and every one lost I promise to pay to the school the sum of 10 cents. For each and every tool that I break or fail to return to the tool room I promise to replace or pay for same at market price. Furthermore to receive my full credit due me I promise to keep my bench tools in best of condition, neither to lend them or borrow from others, and always to leave my bench and lathe neat and clean.

Signed Allan Sweezey Student

Date Sept. 16, 1918

FIG. 1. PLEDGE CARD.

Duties of the Tool Clerk.

To make the duties of the clerk of value to himself as well as a convenience to the instructor, it is necessary to make it as interesting for him as possible, and to also keep him busy. This may be accomplished if the following outline is studied carefully and carried out as seems best desirable for the individual teacher:

(a) To make out a daily attendance slip for the class, noting session-room numbers for the convenience of the office.

(b) To lock the check rack for outgoing class and unlock the rack for the incoming class.

(c) To issue contracts and checks and to file contracts.

(d) To give out supplies.

This part of the system, I believe, can be made still more practical if the student is compelled to fill out some form of a requisition, and to present it to the clerk before receiving supplies.

(e) To receive complaints from the students.
   (1) Student enters class and finds his bench out of order.
   (2) Finds lathe out of order.
   (3) Finds tools missing.
   (4) Finds equipment broken.

(f) In response to (e) the clerk fills out a chaser card. See Fig. 2. To do this he will have to refer to schedule cards, and locate the boy. The card is then made out and forwarded to the principal of the school to look up the boy.

(g) To make out lathe reservation for classmates.

(h) To issue shop order cards and file filled orders. (Fig. 3).

(i) To ring a warning bell shortly before the end of the period, when numerous tools are still out.

(j) To spend idle moments making out reports for the bulletin board, for the interests of classmates, compiling data from the cards of marks and other progress.

Hackley Manual Training School

15 DATE Jan 8. 19

Mr. Fuller

Room 23

Please send to Mr. Hanley F. Dueker

~~Pd.~~ at once with this slip.

[X] Tool Number 9.5 Missing

[ ] Lathe not Cleaned up

[ ] Bench not Cleaned up.

Remarks

No. 46 Tool Room Keeper

FIG. 2. CHASER CARD.

The Shop Order Card and Record.

1. If our boys were tradesmen, or even laborers in a shop, they would be compelled to keep strict time on their work. If they were foremen or superintendents, or cost clerks, they would be required to compute costs from these records. If they were at the head of the plant they would still have to figure with this the entire overhead expense of the shop. All of this may be easily impressed upon the mind of the boy thru the use of a shop card. (See Fig. 3).

2. The card also serves the school with a permanent record of each student in detail, on the entire course, easily accessible for study by the student, and also open to the parent or to anyone interested.

3. Going on record as it does, it stimulates the student to do his best. I find that under these conditions, a student will very often make over, happily and readily, a project rather than have in black and white on the file, a record of his work with which he is not satisfied.

4. It gives the instructor a convenient memorandum to make notations while in conversation with the student on these points: (a) Correction of work; (b) Deportment; (c) Condition of tools; (d) Criticism and record of finished work.

H. M. T. S. PATTERN SHOP

E. C. HANLEY, INSTRUCTOR

ORDER NO. 467 DATE Jan 28

BENCH NO. 4D

STUDENT. Klooster Henry

PROJECT. Surface Plate

DATE PATTERN COMPLETED Feby 15/19

NOTE:—Give each pattern three or four coats of shellac before handing in for credit. Sand well with fine sand paper before each coat of shellac.

EXTRA STOCK None

CRITICISM

DRAFT Ok FINISH Ok

EXACTNESS Excellent

APPEARANCE OF PATTERN Good

REMARKS Construction lines should appear on pattern

FINAL GRADE OF PATTERN E+

COST CARD

TIME 9 1/2 HOURS at 15c HR 1.35

LUMBER 1/2 FT at 15c SQ. FT .20

INCIDENTALS—SCHELLAC, SAND PAPER, SCREWS NAILS, GLUE, ETC. .10

OVERHEAD EXPENSE 1.85

HEAT, ELECTRICTIY, WEAR AND TEAR, EQUIPMENT TAXES ETC. 15% .27

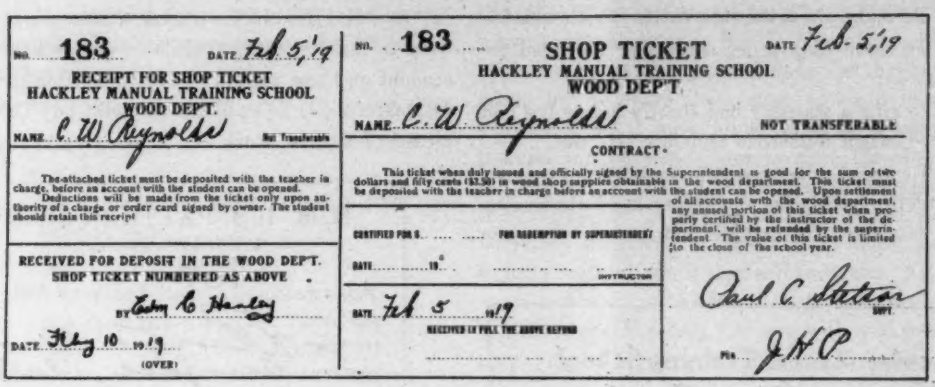
TOTAL COST OF PATTERN $2.10

NOTE:— EACH CARD MUST BE COMPLETED BY STUDENT BEFORE FINAL GRADE WILL BE GIVEN. BE SURE AND SECURE NEW CARDS BEFORE STARTING NEW PROJECT.

FIG. 3. SHOP CARD.

Taking Care of Lathes.

To many an instructor the responsibility of looking after a number of lathes, where the equipment is insufficient to make a regular assignment, becomes in time most burdensome. He will find daily, the lathe out of order, and it would appear that the students had deliberately mussed it up. With the help of a tool room and a clerk, such annoyances will be actually at an end. A student desiring a lathe must first hand to the clerk a registration blank filled out. This slip the clerk must then place on the proper spindle, as shown in the illustration. Until this has been done, the clerk has no authority to hand out any tools to the students. It can be seen at a glance just what lathes are in use and those which may be out of order are noted on the spindle. Since the system has been inaugurated, the lathes have been left clean and in good condition.



No. 183 DATE Feb 5, 19

RECEIPT FOR SHOP TICKET
HACKLEY MANUAL TRAINING SCHOOL
WOOD DEP'T.

NAME C. W. Reynolds Not Transferable

The attached ticket must be deposited with the teacher in charge, before an account with the student can be opened. Deductions will be made from the ticket only upon authority of a charge or order card signed by owner. The student should retain this receipt

RECEIVED FOR DEPOSIT IN THE WOOD DEPT.
SHOP TICKET NUMBERED AS ABOVE

BY Edwin C. Hanley

DATE May 10 19 19

(OVER)

No. 183 SHOP TICKET DATE Feb. 5, 19

HACKLEY MANUAL TRAINING SCHOOL
WOOD DEP'T.

NAME C. W. Reynolds NOT TRANSFERABLE

CONTRACT

This ticket when duly issued and officially signed by the Superintendent is good for the sum of two dollars and fifty cents ($2.50) in wood shop supplies obtainable in the wood department. This ticket must be deposited with the teacher in charge before an account with the student can be opened. Upon settlement of all accounts with the wood department, any unused portion of this ticket when properly certified by the instructor of the department, will be refunded by the superintendent. The value of this ticket is limited to the close of the school year.

CERTIFIED FOR $ ..... FOR REDEMPTION BY SUPERINTENDENT

DATE ..... 19 ..... INSTRUCTOR

DATE Feb 5 1919

RECEIVED IN FULL THE ABOVE AMOUNT

Paul C. Stetson DEPT.

PER J.H.P.

FIG. 4. SHOP TICKET.

Shop Tickets and Mill Bills.

Looking after the school lumber and handling petty accounts are other problems of the instructor worth considering. To best accomplish this end, the student should be required to purchase from the clerk of the board, a shop ticket (See Fig. 4), for whatever amount of lumber he expects to buy from the school during the semester, or if that is not convenient, for the lumber which he will use during the month. This shop ticket the student should bring to his instructor where it goes on file, with his other cards in the tool room. As the boy wishes lumber he should make out a mill bill and the cost of that material should be computed on the card. The instructor should then check over his figures, give him the materials and debit the amount on the shop ticket. Should the shop ticket show a credit to the student at the end of the semester, the instructor should then endorse the ticket for that amount and the student will then be in a position to recover the amount from the board clerk. It is a big mistake to allow a boy to start upon a project before he has secured for himself a shop ticket.

A Campaign to Increase Greater Care of Tools.

Perhaps nothing in the school is neglected more than the grinding and sharpening of tools. Last spring I waged a campaign to improve this condition. The proposition was put up to the boys in this way: The plan about to be adopted is intended to prove that the students as a rule, who generally receive the highest grade in their work, are those boys who spend the greatest amount of time in looking after the condition of the tools. In other words I proved that sharp tools and good work go together. The students are required to fill out a little slip that is termed a "Tool Certificate." Whenever a boy grinds or sharpens a tool, he goes to the clerk and receives one of these slips which he fills out and

TOOL ROOM DEVISED BY THE AUTHOR.

brings in. If the tool is properly taken care of, the slip is punched and deposited in the box in the tool room. At the end of the month the box is opened and the clerk proceeds to outline a complete record for the entire class. The slackers are soon shown up, but in the second month there is noted a decided improvement. To make such a procedure a part of the regular shop routine, would be most burdensome, but it does make for effective work. The record was carried for one month to show exactly how many tools in the shop had never been touched to a stone.

The Bulletin Board.

Every shop should have its bulletin board on which should be placed from time to time clippings and articles of interest to the students. The boys should also be encouraged to contribute to it and the board should be made of general interest. It is a convenient place to publish reports and standings, time and dates for tool clerks, etc.

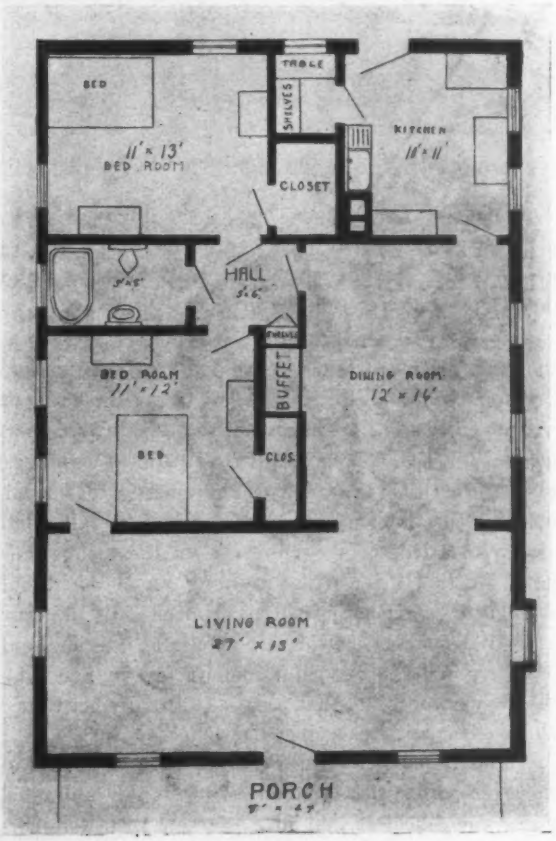
AN ADVENTURE IN HOME PLANNING

Georgiana L. Canfield

THE group taking part in this adventure consisted of a first-year high school class which, it was found, knew nothing of the conventional representations of windows, doors, chimneys, etc., or of how to go about making a plan for a home. The first step was therefore, to make a class drawing, largely from dictation, accompanied by discussion as to the best location for various rooms of the house for light, air and accessibility. Then each pupil was asked to bring to class an original plan in the form of a rough sketch for a five or six-room bungalow. This obviated the complication of stairs. Three sketches were discussed, corrected and carefully redrawn to a simple scale, usually one inch to one foot. Special attention was paid to the arrangement of doors, windows and closets. Plumbing and stove catalogs were consulted to make sure that space enough was allowed for sinks, stoves, bath tubs and other stationary furnishings. The final plans were finished in ink.

The teacher announced to the class one day that, as she was feeling very rich, she was going to give to each one five hundred dollars with which to furnish his or her home. Previous consultation with the domestic science teacher and with several practical housewives of the community, made it evident that this was, if anything, a little above the amount the average young couple in that town would have in starting house keeping. It was agreed that any furniture built into the house such as bookcases, china closets, and buffets did not have to be paid for out of the precious five hundred, but papering, calcimining, portable lamps, etc., should come from it.

Catalogs of all sizes, kinds, and conditions of mutilation filled one corner of the drawing room for weeks while a large bulletin board was covered with all the suggestions from magazine pages, interior decoration folders and photographs at the teacher's command. Trips were made to the stores, sometimes in company with the teacher after school hours, but more often alone to see and discuss with the dealers the qualities and varieties of rugs, linoleums and draperies. Samples of wood finishes were borrowed from the manual training shop that fumed oak, golden oak, birch and mahogany might be more than mere names. As the furnishings for the various rooms were chosen, they were cut from the catalogs and placed in separate envelopes until all were definitely decided upon, when they were trimmed and mounted. A separate sheet about twelve by eighteen inches was used for each room and the same general scheme for the mounting of these sheets was carried out to give some uniformity to the finished results. The



Living Room	$147.55
Dining Room	112.10
Bed Room	75.17
Bed Room	90.20
Kitchen	69.65
Pictures	5.33
Total	$500.00

A TYPICAL PLAN.

TYPICAL PLAN SHEETS FOR THE FURNISHINGS OF HOMES DESIGNED BY THE AUTHOR'S STUDENTS.

accompanying illustrations chosen from different sets of plans show the general plan of mounting. Unfortunately the rug designs taken from colored catalog plates did not photograph well.

In choosing all furnishings the practical as well as the beautiful was considered in every case, but the final decision as to the selection was left to the student as it was supposed to be his home, not the teacher's that was being furnished. Every effort was made to emphasize the fact that each bit of furnishing must be considered, not only for its own usefulness, beauty and value, but also in relation to everything else in the room. The need for just this sort of training was brought out strongly by a remark of a typical member of the class as the teacher was showing a portfolio of interiors sent out by a well known paint manufacturer. She said, "Do you mean to say that people do actually get things all together that go together like that?"

The results obtained were not such as a professional decorator with large city shops and an unlimited purse would achieve, but in most cases they were surprisingly good when compared with the homes with which this particular group came in contact. One pupil furnished her home almost entirely after the manner of Mrs. B's. From her descripton this home must have been a nightmare of golden oak but it was her ideal of elegance. No amount of persuasion on the part of the teacher short of an actual command could shake her from her ideal. Yet, this same pupil returned from a visit with relatives bringing photographs of really beautiful interiors of their home and with intelligent comments on them such as she could not have made without the previous study.

The enthusiasm over the adventure and the results obtained were felt to be so worth while that the same general problem was used three successive years. The first year one of the leading furniture houses offered two prizes of five and two dollars-and-a-half each for the best set of plans. The boys were as much interested in the actual choosing of furnishings as the girls tho naturally not as practical as to the small details.

Every pupil in school will be making a home somewhere if only in a hall bedroom and many in more pretentious quarters. A problem involving fundamental principles of good taste and comfort in this important matter would, therefore, seem quite worth the expenditure of a considerable amount of time. This is especially true in a class or community where there is no predominant industry or other interest to call for work upon specific lines.

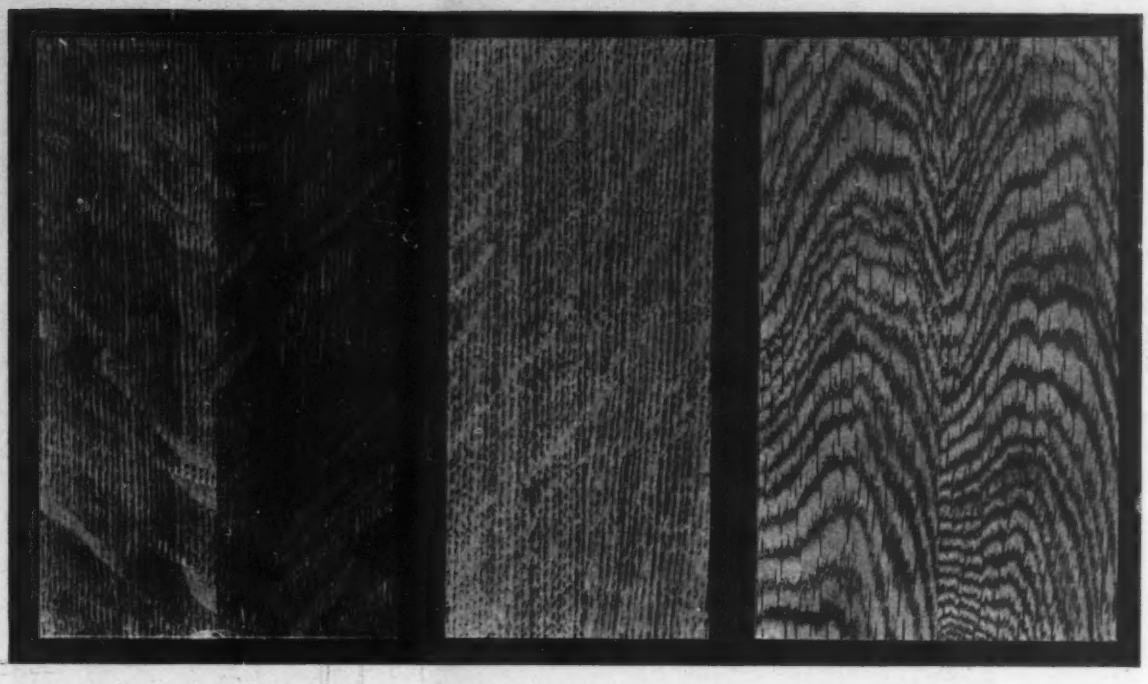


FIG. 3. FIG. 4. FIG. 5.

A FEW POINTS ABOUT WOOD JOINTS

Ralph G. Waring, Syracuse

IN the machine room of every modern furniture, or sash and door factory, there is one man upon whose judgment and training depend many of the results of the various operations after the material has left his hands. His good or bad judgment makes the work of the mill-room light or heavy; makes or breaks the speed and quality of output of the finishing department; and last but not least, his work, whether good or bad, means the difference between profit and loss to the office. He is the machine room "joiner."

His first choice of material is based on *color*; for the fresh cut butts of material just from the slasher show whether the wood be red, swamp, or white oak for example. He will not join red and white or other off-color pieces, if he can possibly avoid it. So far as possible in assembling table tops all butts will show the same color, otherwise the foreman of the finishing room will have some pertinent remarks to make concerning the extra work of shading necessary to match up off color pieces in the table tops.

Next he will lay out his pieces so as to have *heart to heart* and *sap to sap*; altho as a rule he will cut off sapstreaks wherever possible, since the sapwood constitutes that portion of the tree most recently active, contains large amounts of starch and chemical deposits quite in contrast to the heartwood which has long been inactive, and its chemical content is more uniform, with less irregularity in the hardness and softness of the same piece. Because of these irregular conditions glue joints do not hold well when sap and heartwood are together.

Following the removal of the sapwood, the joiner endeavors to lay the pieces, which go to make up the table top, all "up tree" that is, have the grain in the boards run in the same direction. Were this improperly done with woods like quartered oak or curly birch, the machine room would be hard put to it to avoid ruining many tops in which the grain in the several boards run in opposite directions. Here again the finishing department foreman would justly complain that his finished tops were coming thru with dark and light boards due entirely to the difference in light reflection when viewed "with the grain" or up tree, and "against the grain". This is especially true of curly birch where the curl is entirely made up of end grain.

If the joiner is a real mechanic and very much worth his hire he will have an eye for the beauty and balance of *figure* or *grain* in assembling his tops. He will not have a fine-grained, reticent-flaked board matched with a bold-outstanding, wide-figured quartering. Rather he will put the heavy figure in the center, balancing either side of the pin joint and shading out to quite fine, flaked quartering toward the edges. Or he will make up the top of all heavy flake or all fine flake. This kind of judgment allows the house to display a well balanced line of tops capable of appealing to several classes of trade. Certain finishes demand bold figures; others, like Jacobean, require small close-figured matching in order to produce the even toned color, free

from high-lighting. Sometimes in veneer work, as in crotch mahogany, it is necessary to lay two or more sheets right and left of the joint, regardless of whether the left sheet is up tree and the right sheet is against the grain. This is necessary to secure a complete balance of figure for highly ornamental purposes. On the other hand, equally as beautiful effects can be secured when the sheets are turned with a good figure showing but still having the grain running in the same direction.

It is a genuine pleasure to watch a master joiner at his work, his eyes and hands working fast, while his brain directs the almost instantaneous grouping of a handful of boards just from the slasher's bench. Sometimes in a poor carload of mediocre material considerable juggling is necessary, but the man of experience works this material up and makes the face and joint witness marks with incredible speed. The machine room in the basement, and the finishing room near the roof, are a long way apart in the factory but both have often come unpleasantly close together under the work of an incompetent joiner.

The halftones used as illustrations have been made up to show a few of the common mistakes and some which are not mistakes. All are natural color.

Figure 1 is a top made up of two quartered white oak strips laid right and left of a gray swamp oak. The left strip and swamp oak are joined up tree but the right is against the grain. This is really quite a common occurrence under incompetent men. The color combination is bad for the finishing room since the top cannot be matched except in the very heaviest shades.

Figure 2 is an illustration of the fallacy of using sap material. Notice the unsightly streak which will necessitate either bleaching or using for very heavy colors. This piece has a symmetrical balance in the quartering laid toward the center, but the left hand piece is against the grain.

Figure 3 illustrates a symmetrical joining of two pieces of swamp oak with the right-hand piece up tree. This makes the left piece against the grain and lighter because of reflected light. This condition would be reversed in curly birch laid together in same manner, for in this wood the curly figure is produced by cutting across undulating or wavy grain with the result that much end grain is exposed. When viewed up tree the wood is very light and satiny, but when reversed is dead and lifeless because of the enormous light absorption by the end-grain figure.

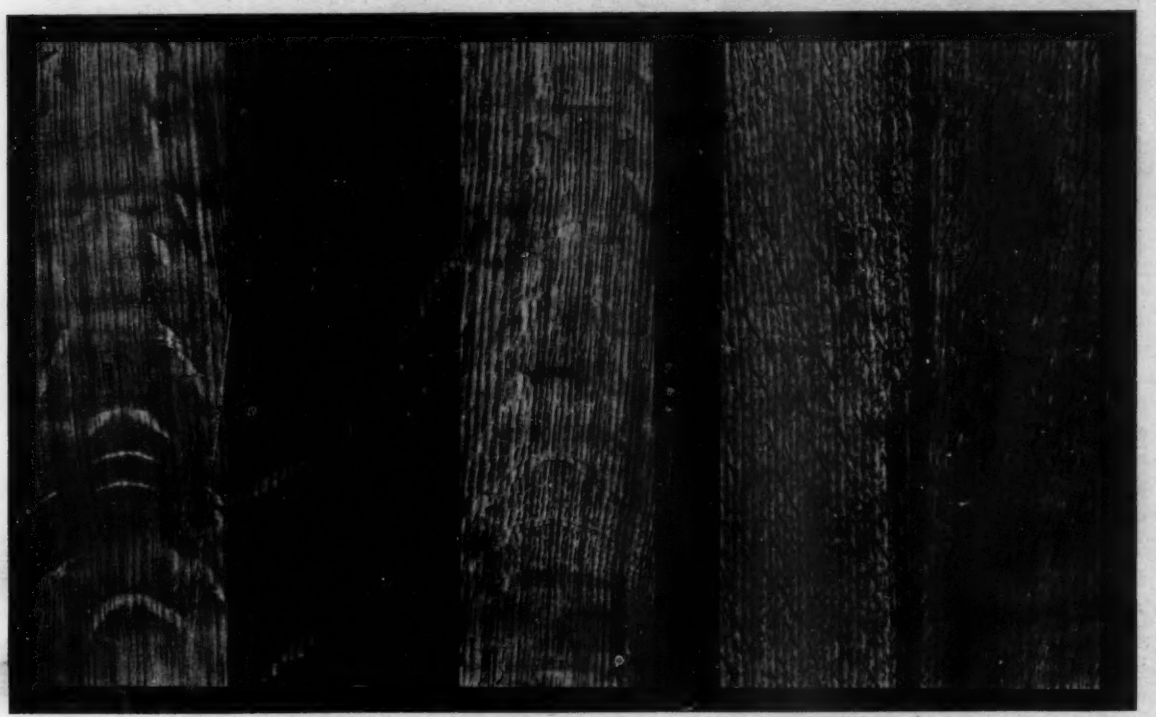


FIG. 1. FIG. 2.

Figure 4 shows two pieces of red oak properly joined together and with a pleasing arrangement of the quarter grain. The pieces are well chosen for color and both pieces are "up tree."

Figure 5 consists of two pieces of red oak, slash cut grain; both up tree, fairly symmetrical figure, and in good color. This cut best illustrates the term "up tree" for the grain is so developed as to appear to be rising from a clear cut firm foundation with no appearance of "standing on its head." Reversing the page will clearly illustrate this point.

These principles apply to practically all woods, since they are basic methods of operation.

THE EVOLUTION OF AN ARTIST IN WOOD

Charles K. Albert

THERE have been other beautiful days but none quite so memorable as the summer day in New Bedford when the brisk southern breeze from the bay searched every corner of the picturesque groups of decaying warehouses, docks and hulks of old whaling ships. Artistic inspiration and reminiscences of bygone days lurked in every corner, doorway, gable and shadowy interior of the old part of the whaling city. What odds and ends of curious mementoes of the sea and distant lands may be salved from these old warehouses and the attics of homes of past generations. Reluctantly we put behind us the temptation to linger and dream, and in a step were upon a modern thorofare, alert to dodge an automobile or trolley car, and to take the right-hand side of the walk.

In this old town with its perspective of home life of the olden time it is impossible to escape the influence of old mahogany; therefore it is not strange that here an artist in wood has come into his own and the longings and striving of a lifetime have come into fruition, as tho it needed but some subtle bond of sympathy to leap intervening generations to join kindred minds and spirits. Only a rare artist can grasp the mental viewpoint of the generations he interprets and can linger over a seemingly unimportant detail until he feels it has been brought to the highest possible degree of perfection. Only an artist has the heart to discard the result of days of study and of the highest craftsmanship for a defect visible to no one but himself, and begin over again.

Fig. 2. Side Board in Eastlake Style Current in the Eighties.

Fig. 1. Dresser made by Mr. King—Typical of the Current Taste in Furniture in the Late Seventies.

Such an artist, matured in such surroundings is Mr. Edwin R. King, whose avocation is the production of furniture of wonderfully subtle proportions and designs and of the most exquisite workmanship. In daily life Mr. King is supervisor of manual training of New Bedford, but furniture making has been his lifetime hobby. Often his students have told him of planks of rare wood from foreign shores which have lain for generations in the attics of the houses occupied by descendants of the old whaling captains. Many of these have been resurrected during exploring expeditions and made into furniture which will descend to children's children.

For about forty years Mr. King has made furniture as a pastime; his first productions were crude in design, proportion and workmanship, but to one with an intimate knowledge of his ideals and work, the transition from his first attempts to his present high attainments has been marked by well defined stages.

During the late seventies when hardly out of his teens, while a workman in a door-sash-and-blind factory with no more than the crude skill required upon work of that sort, the leading in the direction of furniture making was as irresistible as is the leading of other young men toward engineering, art or music. His leisure was spent in the study of the then popular styles

FIG. 3. DESK IN NEW ENGLAND COLONIAL STYLE.

of furniture, the same as the artist studies the best examples of the work of artists of a particular period. The best pieces to be found in furniture stores were carefully studied, for then old mahogany was in poor repute. The popular taste in furniture design of that time is illustrated by Fig. 1, which is the dresser of a bedroom set that Mr. King made. It is of black walnut, with white marble tops for the table, commode and dresser. The veneered panels, columns and pendentives, and pressed ornaments of sawdust and glue were common embellishments of furniture of that period.

Soon after making the bedroom set he entered the employ of a firm producing a good grade of woodwork, passenger elevators, yacht cabins and medium-grade custom cabinet work which was his stepping stone to a large cabinet shop in which only the best class of work was carried on. Here he found the chance for which he had been longing. In this atmosphere of high ideals, the daily association with superior workmen, largely from European countries, and contact with a great variety and quantity of finely designed custom cabinet work, he diligently studied, practiced and acquired the best craftsmanship. He had seen a few pieces of furniture of this sort but as it was not the type of work common in the ordinary commercial shop, like most merely commercial producers, had considered that the amount of it made was nominal and beyond the possibilities of most workmen. His zeal and interest in this class of work was not exhausted by ten hours a day in the shop, but during his evenings and holidays he designed and made many pieces for his own home and for acquaintances who wanted furniture of distinctive design.

Under the inspiration of his environment he progressed by leaps and bounds; tho hired only for a rush time, another year saw him a department foreman in the shop which had so recently been thought of only with awe; while there he designed and built the buffet, a modified Eastlake design, typical of much of the best work of the early eighties (see Fig. 2). This style was an improvement upon the atrocious adaptations and combinations of the Gothic, Elizabethan, the Louises, the Empire and of the different period and national designs, which had run riot for several decades. It indicated a long step in the direction of purity of design and of harmony with the structural lines, furnishings and decorations of a home.

In 1895 Mr. King entered the Sloyd Training School of Boston; after completing the usual course of pedagogical training with exceptional success, he was appointed teacher of manual training at Medford, Mass., and later was called to New Bedford to a larger position. The freedom from commercial stress, more leisure for study, and the surroundings in this city of ancient homes and traditions, with its wealth of old furniture and opportunities for absorbing the viewpoints of previous generations, furnished just the conditions necessary to the maturing of artistic perceptions and fine craftsmanship. In this atmosphere Mr. King, revelled, sketched, photographed and delved among originals of the great masters, until he acquired the ideals of excellence of craftsmanship and became saturated with the conception of design which influenced the period of the great artists of furniture making.

One who is privileged to visit Mr. King will find his home furnished with pieces of exquisite design and workmanship made during the last twenty-five years. Furniture of mahogany, black walnut, oak, cherry, maple, butternut, teak and other woods is tastefully arranged, but the most interesting place is the shop studio. This is situated at the back of the house, and in it are spent many leisure hours making pieces for his

FIG. 4. DESK.

own pleasure; or occasionally, for discriminating friends who find satisfaction in the possession of work created by one whose incentive is the love of the work for the work's sake, and whose craftsmanship cannot be surpassed.

Figure 3 shows an interesting, simple desk which has just been completed from old mahogany gathered from country auctions. Like most of the designs of Mr. King, this desk is of the character of the period during which many of the old families of New Bedford built and furnished their homes. It imparts an atmosphere of repose and dignity characteristic of no other type of furniture, and is inseparable from the homes of prosperous New England families of ancient and honorable lineage.

Many of Mr. King's finest pieces have been made of wood taken from old furniture picked up in auction rooms, second-hand stores, in attics and wherever it may be found. In this way much interesting history may become inseparable from the piece in which it is incorporated. In such cases all authentic history is written upon durable paper with indelible ink and glued upon some easily accessible but hidden part.

In none of the productions of the old masters was the material more conscientiously selected, or the details of construction worked out, with more consummate skill than is applied to every piece of furniture which Mr. King makes. It is the consciousness of this that makes him welcome the scrutiny, suggestions or criticisms of any who know of such work, tho few have acquired his viewpoint. No pains are spared, no joint slighted in the least degree, neither is a piece of wood used unless it is perfectly suited to its high destiny.

The secretary, shown in Fig. 4, is a striking conception and is of a somewhat different type than many made about the same time, of which the highboy, Fig. 5, is an example. Mr. King is a wizard in making drawers; his skill in fitting them seems almost uncanny, for even in the trying south shore climate they seldom stick, and only the slightest push is necessary to move

FIG. 5. HIGHBOY.

them either in or out. The simplicity of Fig. 6, the judicious use of the inner curved corner and the tapered legs suggest Sheraton, and give grace and dignity to a table which less skillful treatment might have made an atrocity or at least commonplace.

The low boy, Fig. 7, is an example of the method by which the sense of proportion and form was developed; the false relation of the clumsy and ungraceful cabriole legs and claw feet to the rest of the piece is apparent, and is one of the things which the artist craftsman can learn to avoid only by experience. A

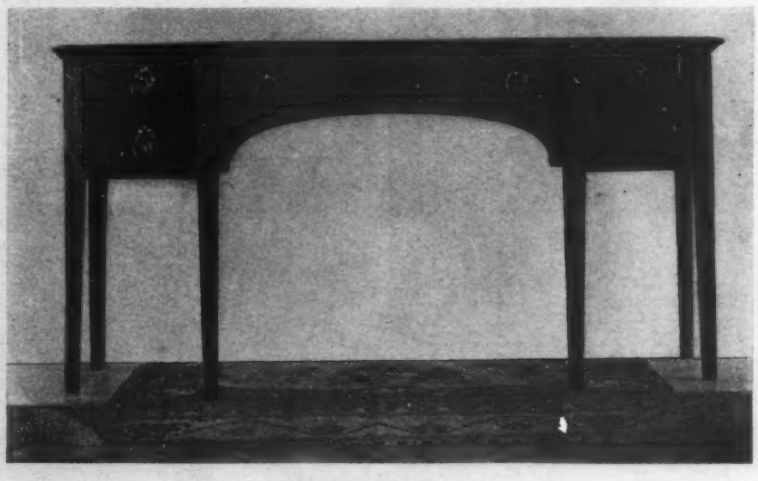


FIG. 6. SEWING TABLE.

FIG. 7. SERVING TABLE.

comparison of these with the finely proportioned and graceful legs and splay feet of Fig. 8 will illustrate the process by which this misconception of proportion was corrected. The delicate shapliness of the serving tables of Figures 7 and 8 were attained by the same careful study that was expended upon more important pieces.

Figure 9 illustrates a low boy, one of the latest and best of the "King Made" furniture. It is extremely difficult to carry out consistently in a design based upon curves, if a long straight line or surface such as the top, forms a discordant element; but in this case the straight line is modified by the pronounced serpentine front. The oval glass, its frame and supports offer opportunities of flowing curves and lines which were skillfully utilized without misjudging the relation between the width and height of the glass. The success with

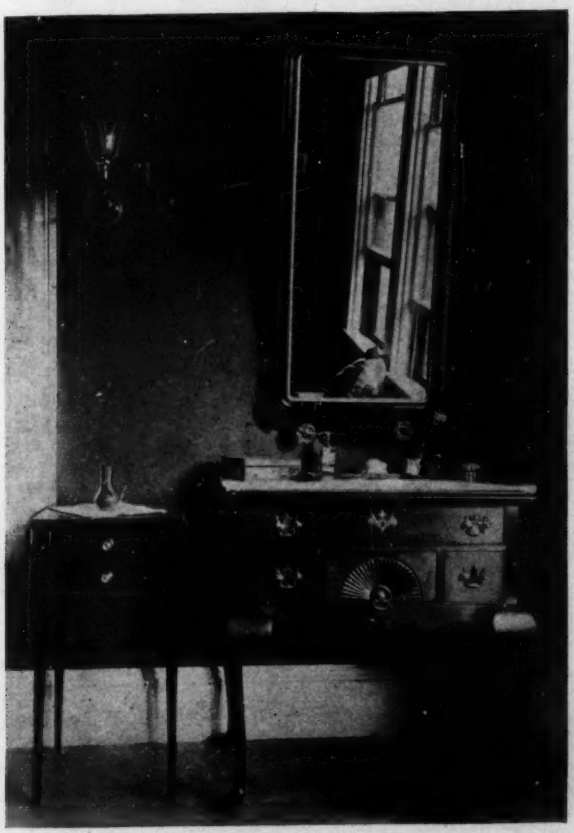


FIG. 8. SERVING TABLES.

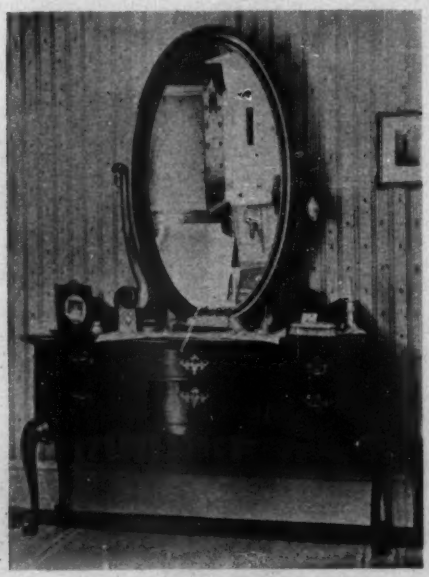


FIG. 9. LOW BOY.

which the problem was solved indicates the certainty of the instinct for proportion and form which a lifetime of study has developed. While Mr. King has made larger and more pretentious pieces, this low boy is without doubt his most artistic production.

Only the speed and surety of workmanship contributed by his commercial experience make it possible for Mr. King to be such a prolific producer in the few hours each week left free by his school work and other interests.

Related Science for the Machine Shop Smith-Hughes Class

H. Howes, Instructor of Machine Shop Practice, Broadway High School, Seattle

Unit M. S. I. 20 Hours.
Measurements.

A—Linear, Outside:

Measure with the machinist's calipers and scale a number of discs or sections of shafting 2 11/64-3 3/64 accurate to the nearest 64th.

The discs above and the rings or cylinder segments—lettered A-H are given to the student for measurement and the results recorded in a notebook.

B. Linear, Inside:

Repeat the measurements with caliper and scale using rings 2 1/64-3 9/64 internal diameter.

Repeat A & B with micrometers.

Repeat A & B with vernier calipers.

(Note: Good description of how to read the micrometers page 19, Starrett's Book. Same vernier caliper, page 20).

Measure assorted bolts and screws and under the proper head give the number of threads per inch e. g ¾ inch cap screw 16 threads, or ½ inch Machine Bolt 13 threads. Sketch and record.

Measure with a Brown & Sharpe wire gage some assorted wires (tagged and numbered) also at the same time give the decimal equivalent opposite the gage number in the notebook. See page 117 industrial Mathematics. Dooley, (American Screw Standard).

Repeat giving American Screw Standard No. with threads per inch of several round head and flat head screws. See Part IV Industrial Mathematics, Dooley.

C—Angles:

Read and record the angles of: (1) A hexagon nut, using a protractor. (2) A globe valve. (3) A Ford valve. (4) A machinist's hand clamp.

D—Tapers:

Measure with the micrometers both ends of a "center" (Morse Taper) and figure the taper per foot. Record in notebook. Repeat with pipe tapers. Repeat with a Brown & Sharpe taper. How are tapers numbered?

E—Measurements of Circles:

Take a cast iron disc about 12 inches in diameter which has been spaced off in concentric circles, with a threading tool, in the lathe, one inch apart and figure the velocity of each circle and record in the notebook.

The disc may turn 10 R. P. M.

If the lathe cutting speeds for cast iron when using carbon cutters is 30 feed and when using high speed steel 60 feet, figure and record in the notebook the proper revolutions for turning the disc when the tool is at each circle.

F—Measurements: Area:

Measure diameter of a piston and a safety valve and figure the pressure on same if the boiler is carrying 110 pounds pressure.

G—Measurements, Weight:

Weigh a block or cube of (a) cast iron (b) brass (c) steel, and figure the weight per cubic inch and cubic foot.

H—Testing Taps with a Spring Balance, 10 hours:

Place a short piece of 3/16 inch square tool steel (tempers drawn to a straw over a Bunson burner in the laboratory) in a vise and measure the tangential pull with a spring balance connected to the end of a tap wrench. The spring balance should be read carefully up to and including the breaking point. Repeat, using a short tap wrench. Compare the smallest cross sectional area of a ¼ and a 5/15 United States Standard tap with a 3/16 inch square and record in the notebook. Test the tensile strength of a hack saw (blade). Place a short piece of a broken hack saw (blade) in the vise and measure the lateral breaking strain using a spring balance. Compare a hand hack saw (blade) with a power saw. Record results.

I.

Test by spark on emery wheel numbered samples, as for example, Tool Steel (high carbon), Mushet steel, High speed, wrought iron, cast iron, Monel metal. Sketch the sparks or the path of the particles in the notebook, with the proper name and number attached. See Demonstration by the instructor.

J—Velocity, 5 hours:

With a counter and a watch determine the R. P. M. of the emery wheels in the machine shop. Figure the rim velocity and record in notebooks. Safety first. Repeat the above with motor. If the emery wheel broke what would happen? What force sends the fragments in all directions? See Cornel's Exp. on the bursting of wheels. What is centripetal force? Why is a fly wheel heavier on the rim? Does the motor man slow down on a curve? Why? Why are railroad tracks elevated on the outside of a curve?

Unit M. S. II. 5 Hours.

Elements of Mechanics—six elementary forms:

The lever, the wheel and axle, the pulley, the inclined plane, the wedge and the screw.

The Law:

The power multiplied by the distance thru which it moves is equal to the weight multiplied by the distance thru which it moves. Thus, 20 pounds of power moving thru five feet equals 100 pounds of weight moving thru one foot.

(1) Levers:

There are three classes: (1) the handle of a blacksmith's bellows is a lever of the first class. The hand is the power, the bellows the weight, the pivot the fulcrum. (2) A crowbar used as a pry is a lever of the second class. (3) The treadle of a grindstone is a lever of the third class.

P: W::1:L

Examples: Having a weight of 2,000 pounds to lift with a lever, the short end of which is 2 feet from the fulcrum and the long end 10 feet. How much power will be required? L:1:;W:P or 10:2::2000:400 lb. Repeat several problems like above.

(2) The wheel and axle: Fig. 1 is a modification of the lever.

(3) The ordinary windlass is a common form. The power is applied to the handle, the bucket is the weight, and the axis of the windlass is the fulcrum. The long arm of the lever is the handle, and the short arm is the radius of the axle. Give two problems on the above and three using a belt in place of the ropes on a cone pulley.

(4) The Inclined Plane: Work out two problems in notebook.

(5) The Wedge: Work out two problems in notebook.

(6) The Screw:

The screw is an inclined plane wound around a cylinder. The nut may run on the screw or the screw in the nut. The power may be applied to either as desired by the means of a wrench or a lever. W x circumfer-

ence of circle equals W x pitch or P:W:p:2.II r. P equal Wp

$$\frac{2\Pi r}{p}$$

W equals 2 IIrP where pitch equals the distance between two of the threads. Work out three problems using a jack screw from the shop. Define in notebook each of the following: (1) Lead (2) Turns per inch (3) Threads per inch (4) pitch (5) Double thread (6) Triple thread. All of above should be thoroly understood. See primer for others.

Sketch in notebook a combination of pulleys and solve two problems on same. What is a differential hoist? Sketch a worm drive chain block. Sketch and show their uses: (1) Planer Spur Gear and Rack (2) Tumble Gear (3) Clutch (4) Lathe back gears, etc. In all combination of pulleys nearly one-half the force is lost by friction. See under "Gearing" chapter X "Vocational Mathematics" Dooley.

M. S. III. 5 Hours.
Belts.

Transmission of Power:

References and Problems.
Vocational Mathematics, Marks,
Shop Mathematics, Holton.

Show what would happen if an endless belt were run over two pulleys of unequal diameter. Of equal diameter.

How are belts fastened? Give four methods. Lace and fasten several short pieces.

What is meant by two-ply? By three-ply belts?

Why is a pulley crowned?

How fast should a belt travel?

Smooth side to the pulley when using leather.

Are leather belts over glued?

Would a thickly laced leather belt affect the lights on a dynamo circuit?

M. S. IV. 5 Hours.
Friction.

Importance in daily life: College Physics, etc. Kimball, P. 46, Nails, screws, ropes, friction in pipes, loss thru friction in energy, loss in heat.

"If the surface of a body could be made perfectly smooth, there would be no friction; but in spite of the most perfect polish, the microscope reveals minute projections and cavities. We fill these with oil or grease and this reduces friction."

"The co-efficient of friction equals the ultimate friction divided by the perpendicular pressure and the ultimate friction equals the perpendicular pressure multiplied by the co-efficient of friction."

Give several problems for notebook as rolling, sliding,

"Coal and Metal Miners Pocket Book," Page 95.
Brass or cast iron.....Dry .15 oiled .103
Cast iron or cast iron.....Dry .15 oiled .100
Steel or brass.....Dry .15 oiled .056

Examples: Frictional resistance of shafting.

Use of soap on wood.
Lard oil on taps.
Cutting compounds.
"Engine oil cause of broken taps", etc. See Machinery Hand Book.

M. S. V. 8 Hours.
Mechanics of Liquids and Gasses.

Pressure at Different Levels:

Measure the pressure at the base of a pipe full of water five feet high.

Figure feet per pound. Verify the exact pressure by referring to a physics.

The work of a pump is the weight of the water discharged multiplied by the height the water is lifted. Figure the output of the boilerroom pump.

Make a small pump with a glass tube and a plunger.

Explain and diagram an airpump in notebook.

See p. 349, Ind. Math. by March.

What is a siphon?

How high may water be lifted? Explain.

How is hot water lifted? Explain.

How long a pipe is required on the inlet side of a pump when pumping hot water?

Diagram a force pump.

Describe the overshot water wheel.

Rain—See Kimball's College Physics, page 47.

What is the airpressure at sea level, Seattle?

What is the airpressure at the top of Mt. Rainier?

Where would you place an air compressor to do good work, on Mt. Rainier or in Seattle? Volumetric efficiency?

M. S. VI. 10 Hours.
Elementary Chemistry.

Identify a few elements and memorize the symbols, e. g. copper, Cu. Iron, Fe. etc.

Also a few of the acids,—e. g. HCL, HNO_3, H_2SO_4, Aqua Regia.

Dissolve some zinc with HCL in a two ounce bottle. Light the gas that is generated. What is it? Save the remaining solution and try it in the shop when soldering. It is zinc chloride.

What other fluxes are used in the shop? What one is generally used on brasses?

Name five and try, or test them. See shop instructor. Record results in notebook.

Pickling Solutions:

Make up some dilute H_2SO_4 and immerse a small iron casting in it, one that has been thru the rattler. Pickle an old piece of copper and brass in a little diluted nitric acid. Etch your name on brass and steel.

Marking Compounds:

Try to use a scriber on bright steel, then note the improvement when blue vitriol solution is used. Make a small rust joint. A glycerine and lithrage joint. Describe and diagram a plating outfit.

See p. 366, The Boy Electrician by Morgan.

Coloring Metals, etc.

Machinery's Shop Receipts and Formulas. Industrial Press.

Select two receipts that interest you from above.

Copy in notebook. Try out in shop. Record results.

M. S. VII. 10 Hours.
Expansion and Contraction.

Place two rods, one steel, one copper, coated with wax in a horizontal, parallel position, three inches apart, and extending out two feet from a vise. Place a lighted candle under each one and one inch below. Note result.

Take a 2 15/16 inch (cold rolled shaft) plug gage—try to place a 2 15/16 inch ring on it. Heat ring and place over gage.

What allowances are made for shrink fits? What is a built up crank?

What is the diameter of the crank shaft on the present type of ship built by Skinner & Eddy? How much does the complete crank shaft weigh?

A piece of steel two feet long is placed between centers in the lathe, as the heat increases because of the work done on it in turning, show by figures how much it expands. When steel is hot and the pressure or thrust on the centers is very great, how will you prevent the centers from cutting and squeaking? See p. 492, Machinery Handbook.

Will Machine oil stay on a hot center? What is meant by the flashing point of oil?

A two-inch pipe, 50 ft. long, carries steam from a boiler to an engine in a machine shop. Show with figures and a sketch how you would take care of the expansion and contraction. Repeat several problems like above in the notebook, getting suggestions from Machinery Handbook, p. 1324.

Cutting a long thread sometimes the heat expands the thread to such an extent that the work must be cooled before the final cut.

Figure the total expansion of the lead screw on the Lodge and Shipley lathe, in the shop, if the temperature was raised 20° F when it was cut. How much difference would there be in one foot?

Sometimes a hardened steel bar ground perfectly true will be sprung out of true, even if slightly heated. Soft steel is less affected.

M. S. 8. 26 Hours.
Elementary Mineralogy and Metallurgy.

Mineralogy:

Identify a few minerals in some hand specimens of ore. Write results in notebook, e. g. ores of copper, lead, iron, zinc, etc.

A grind stone sharpens a knife or axe. Is the stone harder than steel? What does the cutting? How much harder is emery than quartz? How is an emery wheel made? What holds the grains of emery together? Learn Mohs' Scale of Hardness.

Metallurgy:

Sketch the furnaces and describe the making of Pig Iron. Sketch the converter and describe the making of steel. How is brass made? What are bearing metals?

Name a few rare elements. Why are they added to steel? See Moore's Engineering Materials.

Case harden a piece of steel in the shop and state in your notebook how it differs from hardened tool steel. Test with file. Make Brinnell's ball test on a piece of bronze. Record. Make Seelorscope test of the two last runs in the foundry.

Bone, old leather, potassium ferro cyanide (white, red and yellow potassium ferro cyanide) are used for what?

Look up in the Library, and then state in your own words what you can on Heat Treatment of Steel.

How are high temperatures measured?

M. S. IX. 10 Hours.
Power.

Fundamental Principles:

(Horse Power-lift of 33,000 pounds thru 1 ft. in 1 minute):

Prony Brake—Make a simple prony brake with two spring balances and a leather belt or a clamp and a lever with a spring balance on the end.

See p. 322-353 Industrial Mathematics, H. W. March.

Gas Engine Horse Power:

HP equals $\frac{D^2N}{2.5}$ or 4 D N=American League of Auto Manufacturers Formula.

D. Equals diameter of cylinder,
N Equals No. of Cylinder,
2.5 Equals constant.
D equals Cylinder diameter

Compute power of two gas engines in shop.

N equals No. R P M

H. P. equals $\frac{D^2 L N}{12.987}$=American Power Boat Ass'n.

1. Convert Watts into H. P.
2. Convert Kilowatts into H. P.
3. Convert H. P. into Watts.
4. Convert H. P. into Kilowatts.

Torque equals force times leverage.

T equals Torque in footpounds.
S equals R. P. M.
E equals radius of armature in ft.
then motor H. P. equals: $\frac{Tx2\Pi RS}{33000}$ or

T. Equals 3300 x H.P.

$\frac{2\Pi RS}{}$

Measure the torque of simple machine. Apply the above formula to simple problems (several).

M. S. X. 10 Hours.
Water Power.

Use of buckets in the impulse type of high heads. Roughly, the H. P. equals second feet x fall in feet

See treatment and problems page 189-190 in Vocational Mathematics, Dooley, D. C. Heath & Co., Boston.

Turbine used on low heads with plenty of water.

How does a turbine wheel compare with a propeller?

Why should the casing fit closely around the vanes?

The shaping of the vanes as volutes minimizes the loss of energy in shock as the water comes in, and lessens the velocity of the stream as it leaves the wheel.

Has the water any greater effect on the center of the vanes than on the extremities?

Why does the blade curve change as you approach the extremity? Make a sketch of the turbine wheel both horizontal and vertical.

M. S. XI. 10 Hours.
Electric Power.

Deflection of needle with magnet. Lines of force indicated with iron filings on paper above the electric magnet. Sketch in notebook the lines of force as indicated above. Perform experiments in Chapter V of "The Boy Electrician", by Morgan.

Connect a battery and—wires, and write down in notebook the direction in which the current flows, by the hand method. Derive the rule.

Describe the mechanism of an electric bell and sketch in notebook. See Page 142, "The Boy Electrician", Morgan.

Show how a motor moves by cutting lines of force. Chapter XVI. Make the small motor illustrated in Chapter XVI—"The Boy Electrician."

Volts,—unit of potential similar to water pressure. For good treatment of Electrical Units see Chapter V, above book.

Amperes,—unit of current or analogous to quantity of water.

Ohms,—resistance or like sand or rough places in a water pipe.

Sketch or diagram three types of motors; e. g. the Compound, Shunt, Induction.

Why has the Induction motor no brushes?

M. S. XII. 15 Hours.
Boilers.

See also page 218, "Vocational Mathematics", Dooley.

Sketch three types of boilers and state the relative merits of each.

Return tubular; simple, easily set. Externally fired. Water tube. Give three on the market: Sterling, Root, Babcox & Wilcox, Scotch Marine; Internally fired.

Are boilers manufactured in Seattle? Where are they used.

How many square feet of heated surface is required per horsepower? How much water from and at 212°F will a boiler evaporate?

What pressures are common to the three types?

How many H. P. will the largest boilers made in Seattle deliver?

What efficiency has a boiler? Is it 75 per cent, 50 per cent, 30 per cent or 20 per cent?

M. S. XIII. 5 Hours.
Pumps.

How is the feed water forced into the Boiler? Give two common methods.

Sketch a common duplex feed pump in notebook.

A column of water 100 feet high has what pressure at the base?

M. S. XIV. 10 Hours.
Steam Engine.

See also Part VII, "Steam Engineering Voc. Mathematics", Dooley.

Sketch a simple slide valve engine.

Set the valves on the upright engine in the shop. What imparts motion to the valve? Does the eccentric lead or follow a crank when it is going ahead?

Sketch a two-cylinder engine where the exhaust from one cylinder is used in the second. What is it called? What is a triple expansion engine? Sketch. Which cylinder is the high pressure in the triple expansion engine?

Take up accessories and explain; e. g. What is a

lubricator? Sketch—Why is a lubricator dependent on the column of water above the oil?

M. S. XV. 10 Hours.
Gas Engine.

Two cycle. Sketch. Are there any valves on a two-cycle engine? Describe two complete cycles.

Set the timer on the marine motor in the shop. Repeat above on four-cycle engine, and state advantages of each type.

Semi-Diesel: What shop with an international reputation is building this type of engine in Seattle? Can they use a four-cent oil in it? Sketch engine and visit the shop at the entrance to the canal.

M. S. XVI. 5 Hours.
Turbine.

Show how the impulse and turbine water wheels are much like the steam turbines. See p. 370-402, "Mechanical Engine & Machine Shop Practice, by Moore.

M. S. XVII. 15 Hours.
Power Kraphs and Indicators.

Does the steam valve remain open during the whole stroke of a steam engine?

Does the steam pressure increase in an engine cylinder after the valve is closed? What happens? How are these things determined?

The indicator gives an X-ray of the interior of the cylinder and shows what happens. Take several cards on the engine in the school engine room and figure the horsepower from the card.

Make a graph of the boiler pressures of the school boilers, hour by hour, for one day; also on same sheet show the temperature outside at the same time.

Show graphically in notebook the advantage of a ¾-20 thread over a ¾-9 thread screw. Measure with a spring balance the pull in each case.

M. S. XVIII. 15 Hours.
Inspection of Machine Parts and Machines.

Section 13-14, Machine Work, R. H. Smith, Industrial Book Co., Boston.

The unit M. S. 18, is to allow for the careful explanation of various mechanical and scientific principles which will be brought up by members of the class in obtaining an understanding of the various machines and parts with which they come in contact in the shop.

Outline Reading and Study.

Visit Seattle Shops	Taylor
History of Shop Tools	Moore
Small Hand Tools—Oberg	Iles
The Art of Cutting Metals	Beach
Power Graphs and Indicators	Moore
Inventors at Work	Roberts
The Iron Trail	Dykes
Materials of Engineering	Southern
The Gas Engine Handbook	Shafer
Dyke's Automobile Book	Pease
Randum Notes on Marine Engineering	Morgan
Electric Motor Construction	Dooley, D. C. Heath
Harper's Beginning Electricity	
First Year Courses in General Science	Holton, Pub. Boston Indust. Press
The Boy Electrician	
Vocational Mathematics	
Shop Mathematics	R. H. Smith
Machine Work	

IMPROVISED SHEET METAL WORK FOR THE GRADES

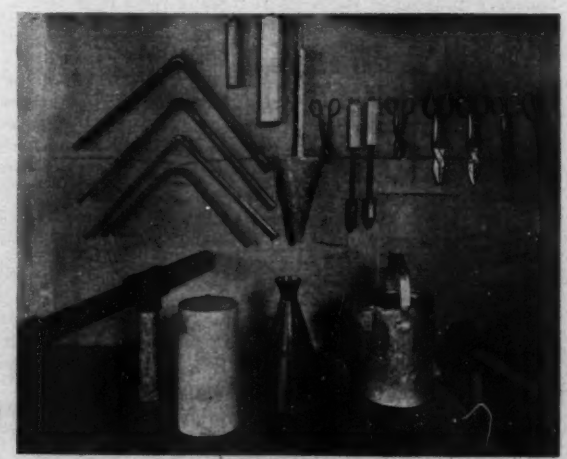
Frank A. Perkins, Jenner School, Chicago

WORK in sheet metal is rapidly coming into prominence as a manual-training subject, and no doubt will soon have an equal place in the curriculum with woodwork. The expensive equipment for a regular sheet metal shop will be a drawback in many schools, but if the teacher is willing to improvise an outfit, there is no reason why any city or rural school in the land cannot have this work. In the past two years the writer has had a class of this kind, consisting of twenty boys, working in ninety-minute periods each day for ten weeks.

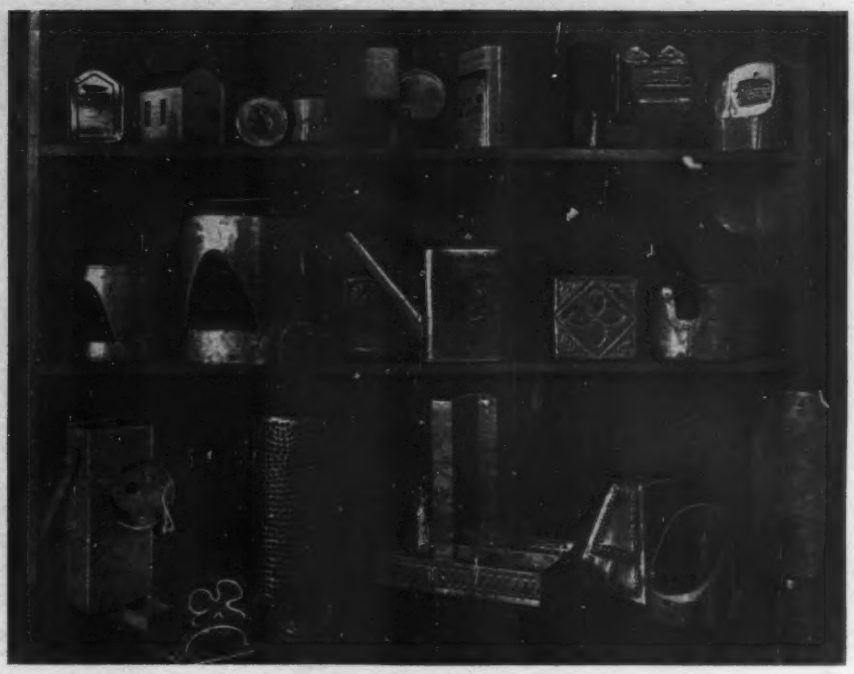
In the Jenner School the subject was born of necessity, and pupils, as well as teacher, were responsible for its development. We have not found anything in manual training that equals this work as a developer of initiative and invention among the boys, and many of our problems have been suggested by them. The idea in this school is to adapt all the handwork to community needs and to stress the points which will make the pupils better fitted to improve their present and future homes. For that reason all the problems have been planned for utility, tho work has now been begun on a series of toys to be made in tin. All the problems are based on some shape of used food-product can, and such accessories as handles, spouts, etc., are worked up from large cans which have been flattened.

The shop equipment is placed in one-half of the room, with the printing outfit, and consists of:

2 two-burner P. S. and W. gas furnaces.
8 pair straight tinner's shears.
1 pair curved tinner's shears.
1 pair double-cutting shears.
3 pair 3-pound soldering coppers.
3 2″ jaw metal vises.
1 ¾″ hollow punch.
6 assorted heavy files.
6 wood mallets (home made).
12 tack hammers.
1 rivet hammer.
1 ball pein hammer.
3 carpenter's saw-filing vises.
Bar solder.



TOOLS USED IN THE JUNIOR SCHOOL METAL SHOP.
The pipes are used as stakes; the wood cylinders are forms for shaping upon.



Top Row—Toy Banks, Stove Utensils, and Match Boxes. Middle Row—Poultry Drinking Fountains, Tea Pot Stands, Watering Pot. Bottom Row—Electric lantern, tray, candle holders, etc.

Acid for flux.

Wood cylinders from 2″ to 6″ diameter and 15″ long for rolling rounds.

Iron pipes from ½″ to 3″ diameter and 18″ to 24″ for stakes.

Several pieces of our outfit have been brought in by the boys, and some were furnished by the school engineer who takes great interest in the work. For mallets, large spools from the tailor shops are used, boring a ¾″ hole in the side and driving in a dowel for the handle. For bending over edges, saw-filing vises are used. The boy inserts his piece of tin, after marking it with a sharp-pointed nail, in the jaws of the vise where it is held firmly by means of the clamp. With a mallet he can now easily fold it over to the required shape. Instead of a saw-filing vise, the tool is now called a folder.

Stakes are used for taking out dents and for shaping. The engineer gave us some pieces of water pipe of various sizes, up to 2″ diameter and 18″ long. Two pieces of each size, threaded into an elbow made an L, one arm of which was dropped into a hole in the bench; the other arm projecting out, was made the surface upon which the shaping was done with the mallet. The large stake, shown in the illustration, was made on a T-fitting one side of which is 2½″ and the other 3″; the upright extends thru a hole in the bench down to the floor. A large, three-cornered file is used for smoothing the edges of the tin when it is roughened by the shears. A nail is used in making the holes in the metal, and the tang of the file is used in reaming it out to the required size.

Half-and-half bar solder is used in soldering. It may be melted in a ladle, and then dropped into cold water to cause it to granulate. Or it may be melted into drops by means of the hot copper. The drops are placed on the spot to be joined and heat is applied by means of the soldering tool. The trade way is to pick the solder off the bar with the copper, but with boys, the above way is much easier. A more perfect union is produced by holding the flat of the copper over the place to be joined for a minute, permitting the solder to be sweated between the tin.

For a flux, purchase at the drugstore ten cents' worth of muriatic acid. Shred some zinc and feed into

TOYS, ETC., MADE FROM WASTE TIN.

the acid until it will consume no more; add 25 per cent water and it is ready for use. In soldering galvanized iron, use the raw muriatic acd. Paint around the parts to be joined, lay on the solder and melt with a copper.

If the solder appears granular after application, the copper was too cool; reheat it and go over the piece again. Have a jar of solution of sal-ammoniac at hand in which to dip the end of the hot copper for cleaning. It is necessary that all foreign substance be removed with a file, wherever the copper becomes encrusted, as this interferes with the transmission of the heat from the copper to the solder. The copper point must be kept tinned. This can be done by cutting a recess with a cold chisel in the top of a brick. Put some sal ammoniac and solder into the recess and apply a hot copper to the mixture. After melting the mixture, the copper will be found to be brightly tinned and ready for use.

Finishing.

Tin when polished with pumice stone and white shellac, takes on a frosted appearance, which is quite attractive. Enamel paints make a good finish and if some design can be applied and carried out in a color scheme, the result is most pleasing. The pieces made in the tin class may be taken to the art teacher for a lesson in design and color.

When the tin work was started, there were less than ten dollars' worth of tools for fifteen boys. To overcome the handicap, tools were gradually added until now about $60 have been invested. The shop has never carried a sheet of tin in stock so that the expense for supplies has been almost nothing; the only cost has been that for solder and chemicals. Where paint or enamel is employed in projects, the expense is charged to the art side of the work. It is felt that the school is bringing something practical into the life of the boy and care is taken to explain that the work is done a little differently from the regular commercial way. The manufacture of sheet metal is described to the boys and its advantages as an occupation are pointed out.

CONSERVATION IN THE SHEET METAL SHOP

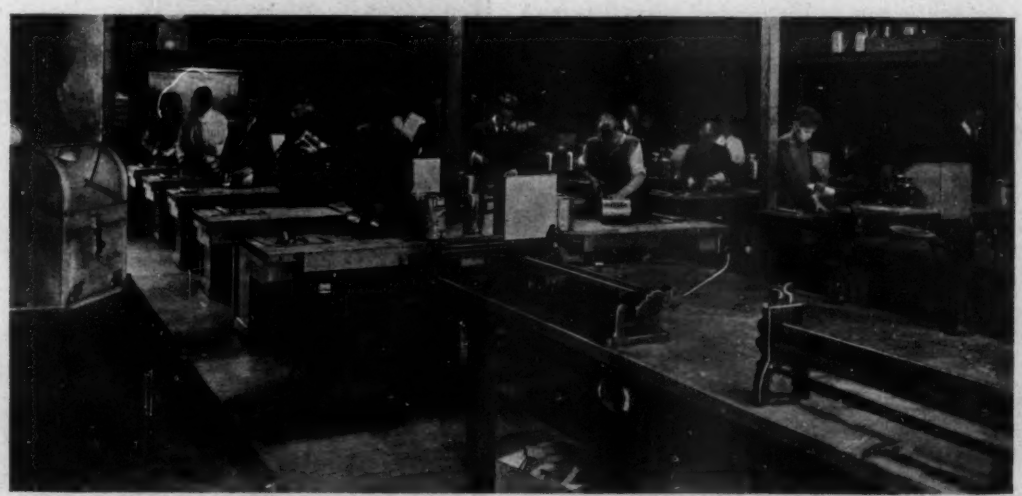
Charles L. Rose, Instructor in Sheet Metal Work, John Muir Intermediate School,
Pasadena, California

WHEN the September term opened in September, 1918, doubtless the manual training department of every school thruout the land was confronted by the same problem,—the procuring of materials with which to carry on the work. With galvanized iron quoted at a prohibitive figure and tin plate absolutely unobtainable on the Pacific Coast, this problem promised to be an especially difficult one for the sheet metal shop.

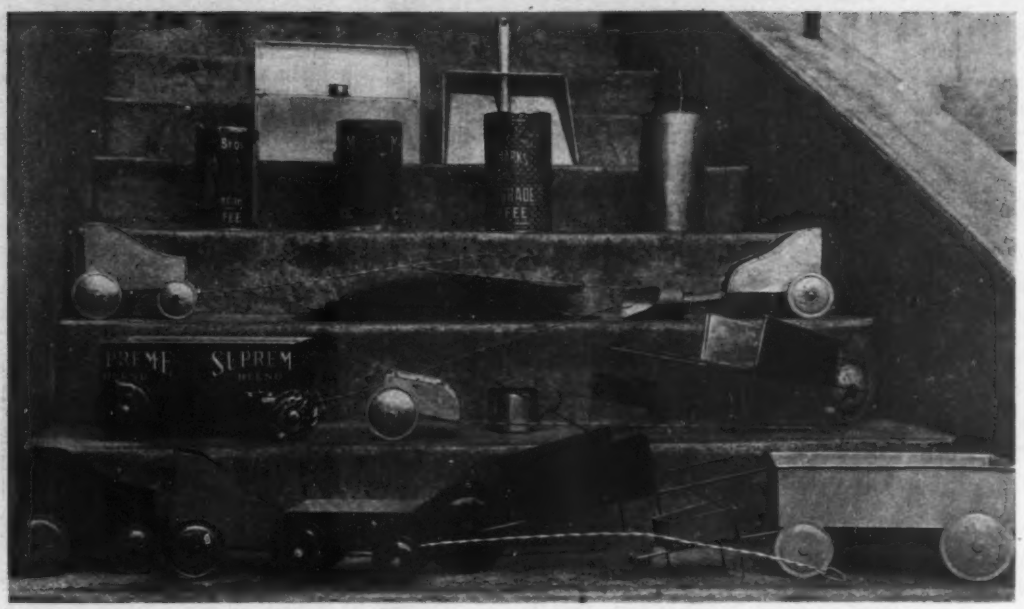
It was successfully solved by us, however, when we immediately began a systematic collection of discarded tin cans. Thru the efforts of the individual pupils and the assistance of the Salvage Department of the local branch of the Red Cross, a generous supply of these cans was quickly obtained and the boys of the different classes began dissembling them and rolling out the tin into flat sheets.

It was soon found that the three-pound coffee cans were the most practical for the purpose intended, and thereafter only this size was solicited. With the material thus obtained and a limited supply of wire and solder, the department began the manufacture of toys.

We designed several models of these toys, which would demonstrate the workings of the various tools and machines used in the sheet metal trade. Among these are wheel-barrows, carts, wagons, chariots and boats of different sizes and designs. The work proved fascinating to the boys, who are seventh and eighth grade pupils,



THE AUTHOR'S CLASS AT WORK.



TOYS AND USEFUL ARTICLES MADE OF WASTE TIN.

ranging in age from twelve to fourteen years.

But scarcely had we perfected our plans, when the school was closed on account of the influenza epidemic, and remained closed until February tenth. Upon the reopening of the school, the work was taken up with renewed vigor, and the toys are now manufactured with surprising skill and rapidity. As soon as one model is completed by a class, another design is begun. The finished products are turned over to the art department, where they are tastefully decorated, and then delivered to the Red Cross, to be sold.

As these toys are more substantially constructed than the average tin toy offered for sale, this organization finds a ready market for them, and the local Director of the Department of Junior Red Cross assures us that they will have no difficulty in disposing of the entire output of the school shop, at an attractive price.

When the original supply of tin cans was becoming depleted, a "drive" was instituted among the pupils of the entire school. This resulted in a substantial increase in the stock on hand, and the work is being enthusiastically continued.

Children in the Holyoke, Mass., Day Nursery Playing with Toys made by Students in the Model Shops. See Page 31.

INDUSTRIAL-ARTS MAGAZINE

Board of Editors

E. J. LAKE S. J. VAUGHN

EDITORIAL

KNOWING "STRAIGHT UP."

THE following question was put to a teacher of drawing who has spent fifteen years teaching the subject relative to design and construction, "What is the most common evidence of the need of more drawing instruction in our schools?" The answer was given without hesitation, "The most common evidence is a *lack of sense of direction and proportion.* Few graduates of our high schools *know straight up,* and fewer of them realize proportion."

We surmise that "knowing straight up" is no mean accomplishment. The sense of direction is essential to all work in which balanced design has a part. It is a sense in which the tradesman prides himself. We are reminded of a master brick-layer who was vain of his ability to "run up a lead" without the use of the plumb bob. We are reminded of the common use of a plumb bob in the studios of the French schools of drawing.

Of course realizing "straight up" is a first requirement in the devise of anything that must bear relation to the law of gravity. It is essential to both the industrial arts and to the trades. There may be some doubt in the minds of the teachers of art as to whether drawing is the best way to develop a sense of directon and proportion. It is the way most commonly practiced, altho the results are disappointing. Perhaps it is not practiced with enough exaction and persistence. Most of our school training is evidently not persisted in to the point of developing accurate judgment, yet the statement from a teacher of drawing and applied design that our high school graduate "does not know straight up" challenges the thought of our common school teachers of art. May we not aspire to this standard?

THE "REGULAR" EDUCATORS MAKE A DISCOVERY.

ONE would think from the numerous volumes now coming from the press on the "Problem-Project Method" that this were a perfectly new subject, and indeed it is among the writers of the volumes and among most of the so-called "regular" or academic educators.

But among the teachers of the arts and vocations, this method has been both widely advocated and extensively used for at least a quarter of a century. Every little shop in the land has been a little laboratory where the steps and principles and values of the Problem-Project Method have been worked out, and where this modern instrument of education might have been seen in operation by anyone interested in departures from the beaten path. But "regular educators" have not been noted for their open-mindedness nor their disposition to risk themselves in the "wilds" away from the beaten path. They have rather been the embodiment of what is now designated as "standpatism."

It is interesting, therefore, for manual training teachers after all these years of familiarity with this method, to observe the flourish and the gamboling sense of sudden discovery which the academic fraternity manifest as they parade this "new" method that has been fully described in almost every manual training text that has appeared in the last decade. Someone has suggested that it is "too bad to wake them up", but we find in the incident considerable of amusement as well as a wholesome half-hope that these recent volumes may be the means of letting the light into other neglected and cobwebby corners of the school world. We are not so unsophisticated as to hope that the credit for this modern idea will be attributed to the proper agencies, namely, the manual training classes and teachers, but we are satisfied to know that the long, laborious, and unappreciated efforts have at last begun to bear fruit. Perhaps in another generation we may hope for a genuine understanding of our work, a real appreciation of its significance and importance, and a serious attempt at cooperation and assistance on the part of the "regular" educators.

MODERNIZING MANUAL TRAINING.

THERE seems to be an impression among some that when we speak of modernizing and liberalizing manual training that we have in mind the total destruction of all organization, all system, all discipline, and all pedagogy. When it is proposed to substitute something vitally needed and something interesting from the boys' point of view for the cut-and-dried models, there is a genuine fear on the part of a few that the sacred and inherited principles of pedagogy are endangered.

The suggestions for modernizing manual training by making it expressive of the life and conditions of the times is in line with the best thought and practice not only in manual training but in the academic fields as well. The day has passed when the teacher of arithmetic, physics, history, or economics confines his work to following an unyielding list of facts recorded in a textbook or a skeleton outline inherited from a past generation. He goes into the facts and conditions and business transactions and municipal problems as they arise about him and organizes the material for the enrichment and interest of his classwork. The class excursion is a daily occurrence in almost any school for the collection of materials of study and the observation of facts and processes and movements in an environment of reality.

To select projects for the manual training work which touch a vital phase of boy life does not destroy pedagogy. Neither does it bring disorder, nor thereby become haphazard and unmethodical. It does not de-

stroy all the value of a project by permitting a boy to have some part in the designing of it. The value is infinitely increased from every point of view. Suppose each boy of a high school class is given the problem of constructing a small table. Is it so vitally important that all the tables be exactly the same size and shape? Would a difference in the length or height or width to meet individual needs and tastes be fatal to it as a manual training project? The problem of construction would be identical in every particular even tho the tables varied in both size and shape. The only difference in the procedure would be in the designing and drawing. The shopwork need not be disorderly simply because one boy's table is two inches shorter than his neighbor's.

One of the chief difficulties in discussions affecting the manual and industrial arts work is the lack of uniformity of understanding with reference to the purposes and aims of the various lines of work. Let us repeat *that the acquirement of skill is not the primary aim* in the ordinary manual training work of the grammar and high school classes. Such an aim would materially modify both the method and the content of the instruction. So long as manual training is given as a part of general education or for purposes of appreciation, the primary aim will never be the accumulation of manipulative skill, altho that will be an important, subordinate item.

Of course the work must be organized. *Unquestionably* there should be order and discipline, but when organized work is provided that has interest and meaning in it, the problem of discipline is reduced to a minimum. When disorder arises in such work, somebody has bungled the job. The work of the shop must be significant to the pupils, and it must be so organized as to eliminate waste of time and material and to make possible the meeting of substantial and immediate needs within the realm of the pupil's life.

The modern movement is toward the investment of manual training with thought content; the working out of problems that have a real bearing on life interests; the using of the tools of industry because there is an important job to be done, *not the doing of a useless job because there are important tools to be used.*

SHALL THE JIG BE USED?

The jig has finally come to school, so "the jig is up." There are those who feel that this modern device or method is a great boon to the shopwork of the school, while others are very sure that it literally sounds the death knell of the educational features of shopwork. The jig is a short cut in quantity production of standardized parts. Its use is an established practice in industry. Does it have a place in the school?

In the first place, the ordinary school has but little need for production on a large scale of any articles made in the shops. Hence, there is but small danger of overdoing this type of work. If a class in woodworking undertook to produce a dozen chairs by the jig method, the design would first have to be made or selected, the method of construction would have to be determined, the various jigs necessary to produce the particular style of chair selected would have to be invented and constructed, and the mill work would have to be done on the stock, before any work at all could be done with the jigs. To be sure, the jigs eliminate the measuring and laying out of joints, and render some of the tool work partially automatic, but there is a great deal of the same kind of work required in simply designing and making the jigs. Then, too, after all the jig work is done, the chairs are not finished by any means. There is still much tool work to be done. The assembling and gluing are yet to be done. And the sanding, filling, staining and varnishing cannot be done with jigs. With a very limited number of pieces, we doubt whether either time or labor or skill is eliminated by the use of jigs.

Another point that is worthy of consideration in this connection is the fact that quantity production is a prime essential in industry and that all the means for the elimination of waste motions, waste time, unnecessary steps, useless repetitions, etc., are regarded as legitimate and even necessary in the industrial world. Even if a student is taking shopwork for its value in general education and appreciation, it would seem quite advisable for him to have a little experience in some methods of work and organization that at least give him some conception of those of the commercial shop.

But in the ordinary manual training or industrial work of the high school, jigs and the jig method should never be the universal practice. They should be used occasionally to give certain types of organization and experience, not necessarily to produce large quantities. As a general proposition, each class should design and make its own jigs, not simply adapt and use those made by previous classes.

Looked at from this point of view, we doubt whether the coming of the jig into reasonable and judicious use in the school threatens any great danger to the educational significance of the work or need cause any alarm among those who have been disposed to look upon it as a vicious intruder.

The Silk Association **of America has recently urged the establishment of industrial art schools to promote a high degree of development in industrial art in relation to commerce and the general welfare of the country. The association points out that it is doing its part in this great work thru exhibits, competitive prize offers and other methods of education, in order that artistic talent may be encouraged and stimulated and that all influences may be fostered for the advancement of public taste.**

The Association recognizes the demand for well-trained designers and craftsmen in industry, shows that the demand is increasing and points out that the supply has been inadequately met thru lack of proper facilities for training.

The establishment of such schools, in the opinion of the Association, would fill a long-felt want in silk and other artistic industries and would afford an opportunity of putting American finished products on an equal footing with other nations.

Manual Training in Elementary Schools of California

Edwin R. Snyder, Commissioner of Industrial and Vocational Education,
California State Department of Education

Manual training has secured a permanent place in the courses of study of all elementary schools large enough to warrant the employment of special teachers of the subject. This place has been secured after thirty years of experimentation during which changes in the aims of the subject, the courses of study and the methods of instruction have been so numerous, complex and conflicting that nothing short of a volume would be enough to record them. However, the same confusion as to aim, content and method has characterized every other subject of the elementary school course during this period.

Altho educational philosophers have seen in manual training an instrument for formal discipline, for general culture, for genetic or mental and physical development, laymen have supported the subject because they have seen in it a preparation for industry or a training which would lead to an understanding of the same.

Unfortunately, in the attempt to secure the greatest amount of discipline, culture and individual development, thru the application of the subject, it has been modified in content and method in such a manner as to produce a minimum of preparation for participation in industry or for a comprehension of the industrial processes and products common to modern life.

Tho the subject may possess disciplinary, cultural, sense, and general developmental values, these may be better attained if in practice the subject deals with occupations, processes and products which are common to modern life. If we accept this as a principle then it must be clear to all that manual training courses in the elementary schools usually fall far short of being satisfactorily administered.

Present Course Too Narrow.

It is generally conceded that manual training in the intermediate grades—that is, in the seventh and eighth grades—is a prevocational subject in that its dominant aim is to offer opportunities for the pupils to test out in a preliminary way their qualifications for a number of the common trade and industrial occupations.

The usual manual training course, as outlined for these grades, neither exposes the pupil to the processes, products and conditions of industrial occupations, nor does it give opportunity for training in the operations common to the same.

The work is too largely confined to benchwork in wood, dealing with exercises or with cabinet making of a similar character. It should be clear to all that as an exposure subject in industry, cabinet making is one of the least profitable courses that could be presented in a California school. Further, the operations demanded by the execution of this kind of work are not suited to the mental and physical development of pupils of this age, because they are but slightly interested in the strictly technical aspects of any of the occupations. They are, however, profoundly interested in the larger, more general aspects of the trades and industries common to their local community. Genetically their minds are far in advance of their power to execute skilfully with their hands. For this reason they are impatient under the pressure usually exerted to secure skilled craftsmanship. They think of industrial operations and products in a large and comprehensive way. They are not interested in producing refined products from the raw material, but are very greatly interested in controlling and manipulating the machinery of industry.

To be sure, they prefer the present manual training work to any other school subject. It would probably be impossible to maintain the subject in such manner as to make it relatively distasteful to them. It is the only subject of the curriculum which can be made more attractive to the pupils than their usual play activities. This is especially true if the course is so organized as to give them opportunity to express the industrial ideas which they have gleaned from their contact with life.

Type of Course Needed.

Accepting the principle that the dominant purposes of manual training instruction in the seventh and eighth grades are to develop a larger mental grasp of the industrial occupations of the community, to provide opportunity for the pupil to try his hand at some of the simpler operations of the various crafts, and to develop such hand control and skill as may naturally grow out of such operations, we are led to the conclusion that the course of instruction provided should be somewhat as follows:

First. It should include home occupations of an industrial character.

Second. It should include a practical study of the machines that produce and develop power, light and heat, together with any other machines that may be common to the local community or that may be of interest to the pupils.

Home Occupations. This course should consist of: A study of the repair of furniture, including the replacement of broken parts, gluing, upholstering, and finishing; screen making, fitting and hanging; window repairing, including fitting and glazing; door repairing, including hanging and lock repairing; a study of the repair of bathroom fixtures, including the flushing system, taps and drainage pipes; a study of the water system, including the repair of hydrants, taps and sink drainage equipment; a study of the lighting system, including meters, fuses, switches and insulation; the study and the repair of electrical apparatus, such as bells, vacuum cleaners, etc.; the study of gas as applied to lighting and heating; the repair of sewing machines and other household machinery and equipment.

In order to perform this work properly it will be necessary to give instruction in the simple elements of carpentry, cement work, plumbing, tinning, forging, painting, kalsomining and papering. Where the home of any pupil does not afford material upon which he can work, provision should be made by the school for securing suitable projects.

Study of Machines. This course should consist of a study of the dissembling, assembling and operation of gas engines, steam engines, pumps, generators, motors, transformers, storage batteries, carburetors, magnetos, ignition systems, telephone and telegraph instruments, and a study of the application of light, power and heat to modern industrial operations. A study should also be made of any other machinery that may be found in the immediate vicinity.

The Laboratory and Its Equipment.

In order to carry on the type of work suggested above it will be necessary to remodel our manual training laboratories.

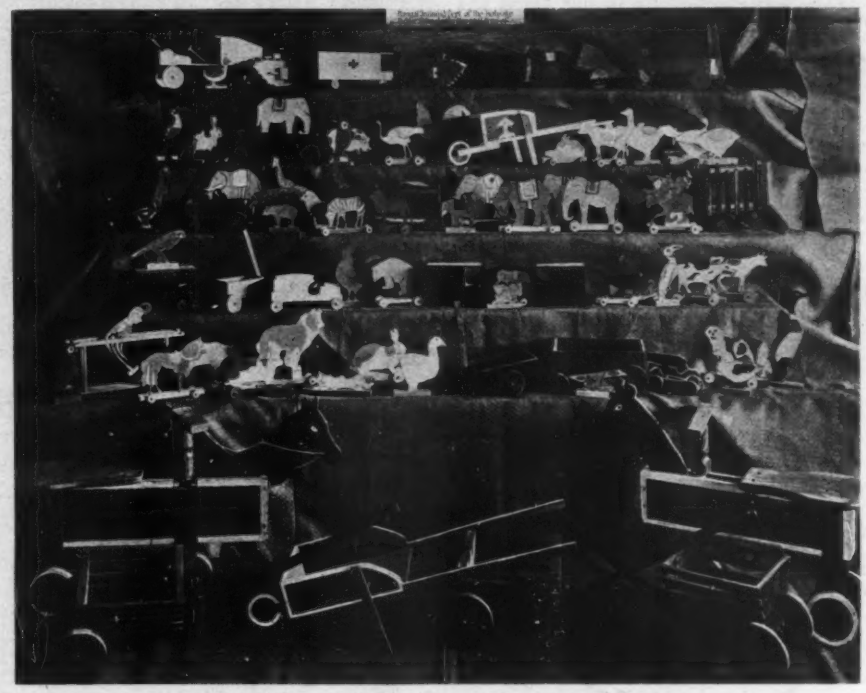
Instead of an equipment of twenty or thirty woodworking benches, placed in nice, checkerboard formation, it will be necessary for us either to fit the room with a combination of woodworking, iron working and electric working benches, or to fit it with a few of each. In addition to this equipment it will be necessary to have for experimental purposes steam and gas engines, pumps of various kinds, dynamos, motors, transformers, carburetors, storage batteries, telephones, buzzers, and such other power machinery and additional equipment as may be necessary to maintain a thorogoing course of instruction in this line. While this equipment should be standard, it need not necessarily be new. In fact, equipment that has been abandoned would probably serve the purpose of instruction fully as well as new equipment. The pupils should tear down these machines and build them up and prove their workmanship by successfully operating them.

This type of work should not be confused with gas engine and automobile repair work. While the pupils of these grades can replace parts and repair machines of this character under the close supervision of a teacher, the aim of the work is to get an understanding of the workings of these machines and the part they play in industry, rather than an understanding of the methods of repair.

Schools that are maintaining laboratories of the old type should gradually transform them by adding the iron working and electric working equipment, and later by the addition of equipment for the study of the application of light, power and heat.

The New Manual Training Teacher.

In order to bring about this modification of the manual training courses of the state it will be necessary for most of the teachers to secure some supplemental training.



TOYS MADE IN HOLYOKE, MASS., SCHOOL SHOPS.

While it would take many of them a considerable length of time to acquire all of the knowledge necessary for an instructor of the course contemplated, these teachers can remove their deficiencies by taking up these topics in our night schools one at a time. Each teacher of manual training who expects to remain in the work in this state should work out for himself a program of study organized in short units which will, in the shortest time possible, fit him for the different lines of work suggested above.

The modification of the present manual training courses should begin by the addition of sheet metal, plumbing, or electrical work. It is of little importance which should come first. The choice would probably depend upon the qualifications of the teacher and the availability of the equipment. After these subjects have all been introduced the power laboratory should be established and instruction begun in this department.—*California Blue Bulletin.*

HOW THE HOLYOKE MANUAL TRAINING DEPARTMENT HELPED.

Robert E. Hamill.

The Holyoke Day Nursery was making its drive for funds to purchase a new building. We gave what we could of money and then discovered that we could do something for the "Tiny Tims" themselves. The teachers were approached first and in turn the boys in the seventh grade. Then the avalanche of ideas descended burying teachers right out of sight, in fact, we didn't need teachers much except to requisition for lumber and paint and help the janitors close the shops. The work continued in five centers for about six weeks and the result was five large boxes of toys packed and ready for the expressman to deliver.

We had looked askance at the toy field and do yet especially at the toy "systems," but the doubting Thomases have been convinced that the proper motive goes a long way toward making toy manual training projects worth while. Indeed, the project has yet to appear that makes the same immediate appeal to the minds of eleven-year-old boys and that of itself furnishes the same degree of interest and develops the initiative in design, color and construction that our toy projects this year have resulted in. To be sure, some of the amateur designers groped forward hesitatingly and others tumbled into pitfalls but with tact and encouragement to begin again they arrived at a point of assurance and self-assertion, in wood and color if you please, that has been so encouraging that we may contract to furnish our children's wards in the City Hospital.

It isn't necessary to more than mention the little ones whose happiness was the real object of our efforts. They divided the toys with bright and shining eyes—rode the horses, filled the carts with blocks and called each other to witness that this was a camel, an elephant, a duck or a lion as the case might be. Some toys however we fear will tax the imagination of the Sister in charge to fathom the mind of the young workman who produced it.

If you have struggled with or against toys to find the motive that will make the work profitable, try this one. Perhaps as Dean Anthony puts it, it will put "real life" or "real love" into your schools.

Dr. L. D. Harvey, of Stout Institute, Menomonie, Wis., recently celebrated his seventieth birthday. Dr. Harvey was made president of the school in 1908, and in 1910 the institution was placed under the control of the state, with Dr. Harvey in charge.

PROBLEMS AND PROJECTS

The Department of Problems and Projects aims to present each month a wide variety of class and shop projects in the Industrial Arts. Successful problems are invited and will be paid for. A brief description of constructed problems, not exceeding 250 words in length, should be accompanied by a good working drawing. The originals of the problems in drawing and design should be sent.

Problems in benchwork, machine shop practice, turning, patternmaking, sewing, millinery, forging, cooking, jewelry, bookbinding, basketry, pottery, leather work, cement work, foundry work, and other lines of industrial-arts work are desired for consideration. The editors will not accept the old hackneyed problems of footstools, taborets, towel holders, etc., which have been made from time immemorial, ad nauseum.

Drawings and manuscripts should be addressed: The Editors, INDUSTRIAL-ARTS MAGAZINE, Milwaukee, Wis.

FOLDING HURDLE.

Allen Berger, Durant, Okla.

Boys, in general, are interested in out-of-door sports, and anything they can do to contribute to the success of these sports they will do with all their might.

The accompanying drawing is of a folding hurdle which we have used quite successfully in our track and field meets, and one in which the boys show a great deal of interest and pride in getting ready for use. It is easily constructed, easily handled, requires little space for storage while not in use, and the cost of the material is small.

The work of construction must be accurate in order that the hurdle will stand at exactly thirty inches when arranged for the low hurdle, and at forty-two inches when arranged for the high hurdle, and the cross bar must be in a horizontal position for both. The top airrases on the horizontal bar should be slightly rounded to protect the boy's shin if he should strike it. The finish should be a dark green paint. The project serves very well as an example for contrasting the use, preparation, and application of paint; and the stains, fillers, and varnishes used on other projects.

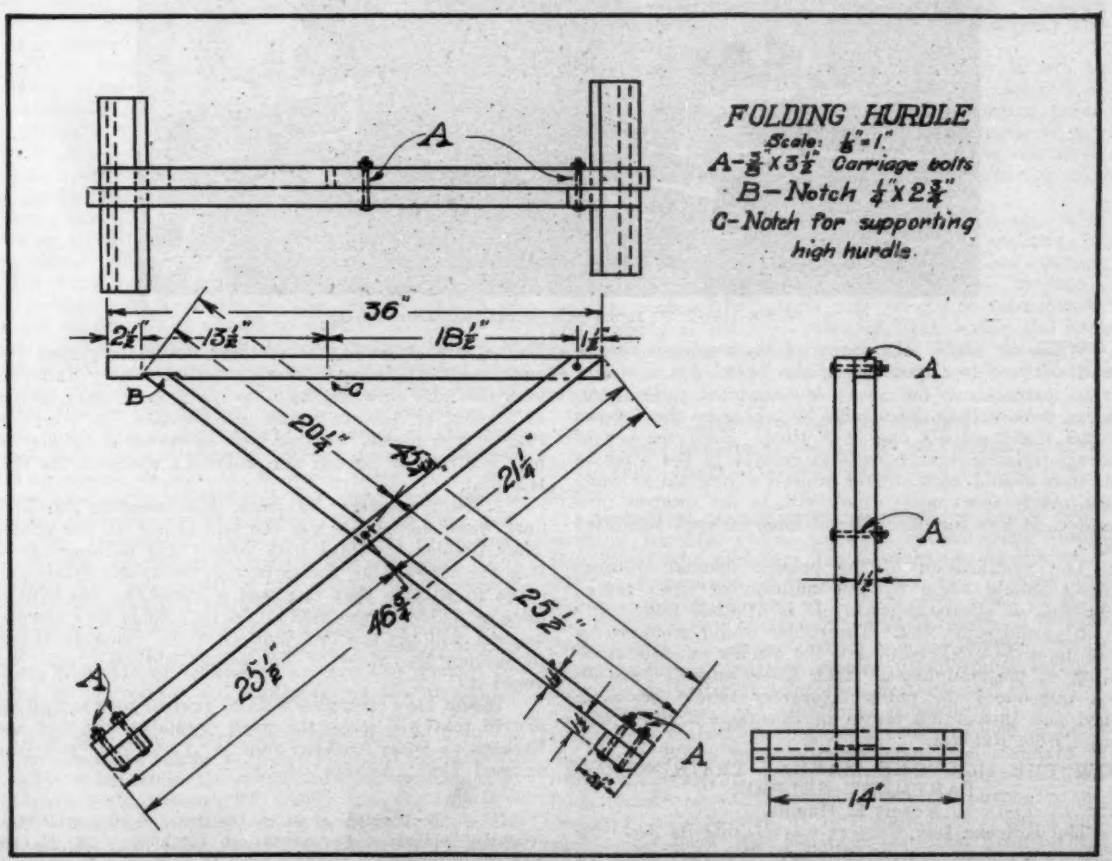
CHAIR.

L. Day Perry.

While of chairs there is no end, the one illustrated herein has been selected for its simplicity of design, its durability and the particular opportunity for simple inlay work. It is a problem which is within the grasp of the eighth-grade boy of real ability, and easily one for the second-year high school student. The chair was constructed by a skillful eighth-grade student and its usefulness cannot be questioned.

Reference to the drawing will give details of construction. American walnut is a good medium in which to work, inasmuch as the grain is close and permits working in inlay without the usual attendant danger. It is also very durable and stands up well under continued use. Dowel construction may be employed in a chair of this type with success. Note the method of using a long chair bolt for the purpose of reinforcing the back; this in addition to regular corner blocks. Such reinforcement is a prime necessity if the chair is to stand up long under misuse.

The inlay on this chair of walnut is white maple, the strips are $\frac{1}{16}$" in width and set in $\frac{1}{4}$". Reference to books



DETAILS OF FOLDING HURDLE.

on inlay will give definite instructions for cutting the grooves and preparing the strips. No detail has been given for the placing of these for the reason that the photograph gives a general idea as to proportion and placement. A caution is advisable here; that is, that hot glue only should be used for the securing of these strips, if prepared glues are employed bubbles will appear on the surface months after the chair has been in use.

The seat is the ordinary slip seat. Laminated stock ¼" in thickness was used, reinforced by two strips ¾"x2", secured with screws. A layer or two of commercial cotton was placed over the top of this and covered with first grade leather. The method of upholstering plain board structure is discussed in Johnson's Simple Upholstery, and this method should be employed on a seat of this description. The seat is secured to the chair frame by means of screws run thru the corner blocks. These blocks must be placed the proper distance down from the upper edges of the rails to accommodate the seat.

This structure after assembly was filled with a walnut paste wood filler, sanded, and finished with two coats of white shellac. The first coat was sanded lightly and the second rubbed with pumice stone and oil. This treatment gives a pleasing dull finish of real durability.

A SHOP KINK.

F. H. Wilde, Selma, Calif.

Nails may be driven into hardwood with a saving of time, wood and patience, by simply sticking the points into paraffine wax. There is no need for the method suggested in a recent issue of the Magazine. The writer bores a hole in the end of his hammer handle and keeps this filled with wax. A mere touch of the nail point makes the driving easy and practical.

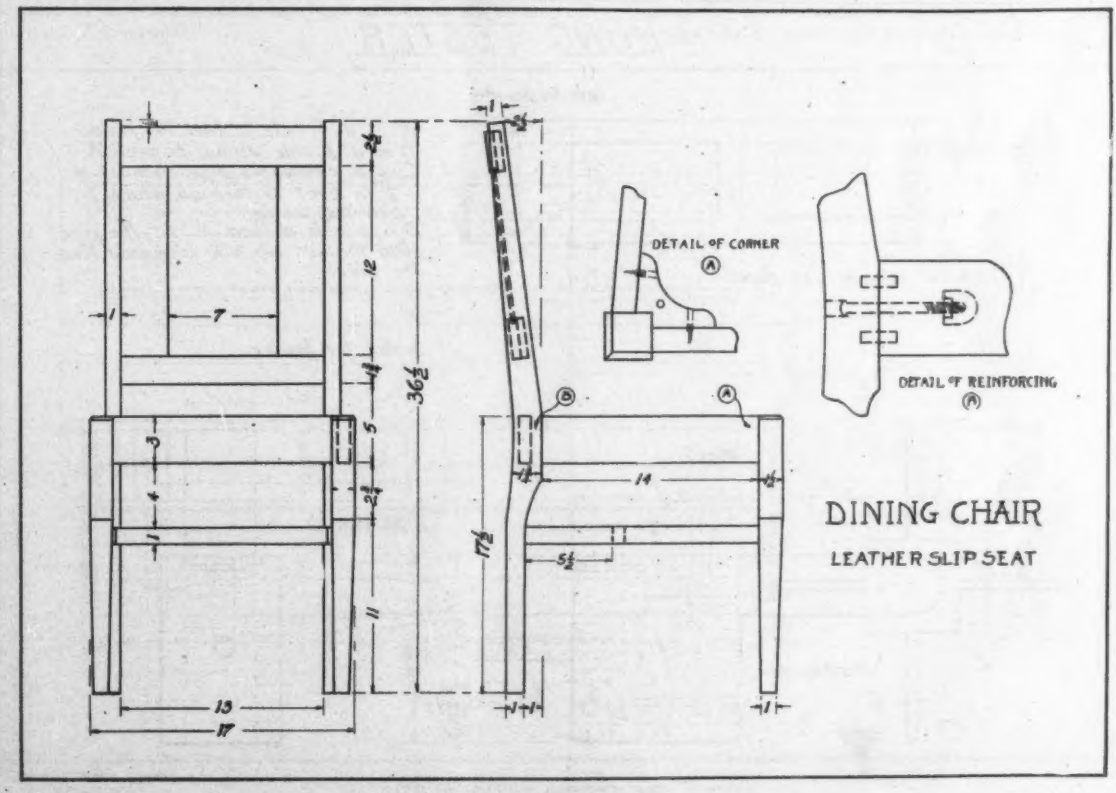
"LUNG TESTER" TOY.

Percival Angove, Instructor Manual Arts, Ionia, Mich.

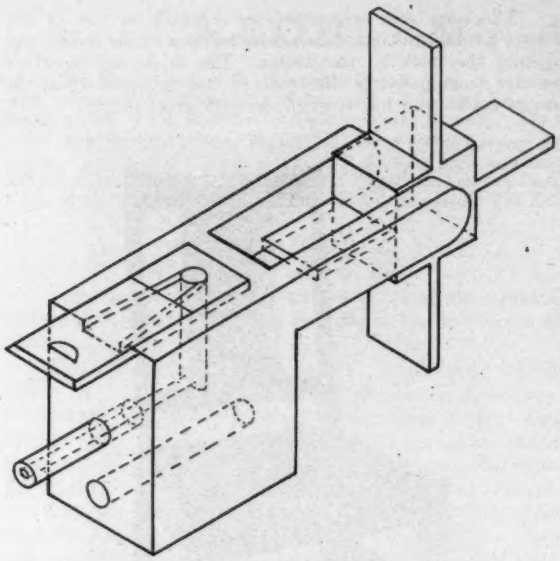
The Lung Tester Wind Mill is a project that will naturally create interest among the grades as well as offer training in squaring, sawing, boring and chiseling.

The idea was originated by a pupil in one of the writer's woodworking classes who made a crude model and sprung the trick on the writer. The trick toy described by the accompanying illustrations was designed from the crude model and has been made with good results.

INLAID DINING CHAIR.



DETAILS OF CHAIR.



ISOMETRIC DRAWING

Sliding panel partly open showing the hole and slot for powder exit.

LUNG TESTER TOY.

It will be seen that it answers a two-fold purpose. By blowing thru the bottom hole "D," the wheel will turn at a great speed thus answering as a wind mill, and by changing the Pipe Stem "C" to the upper hole "B," the stream of air will be directed thru a well and up and back out of a slot under the sliding panel. By drawing back the panel, the hole "A" may be filled with talcum powder. If then a person blows into "B" the powder will come out thru the slot causing a white mustache on the user's face.

It will be readily seen by the drawing that it is perfectly harmless, the outlet for the powder being such that it will only strike upon the upper lip directly under the nose.

The accompanying illustrations are self-explanatory. The body and wheel are made of separate pieces of white pine. Any soft wood will answer the purpose. The wheel turns upon a brad driven thru the projecting arms as an axle.

The operator after filling hole "A" with talcum must be sure to slide the panel back into place before blowing, then the powder will strike the bottom of the panel and find its way thru the slot which is the only outlet. It is well, of course, for the person springing the trick to blow first thru the bottom hole to make the wheel spin, then remove the pipe stem (which is a piece of a common corncob pipe stem) to the upper hole (this of course should be unseen by the second party). The boys will enjoy making this and at the same time it offers a splendid exercise in the nature of a clean, harmless trick.

A PAPER CUTTER.

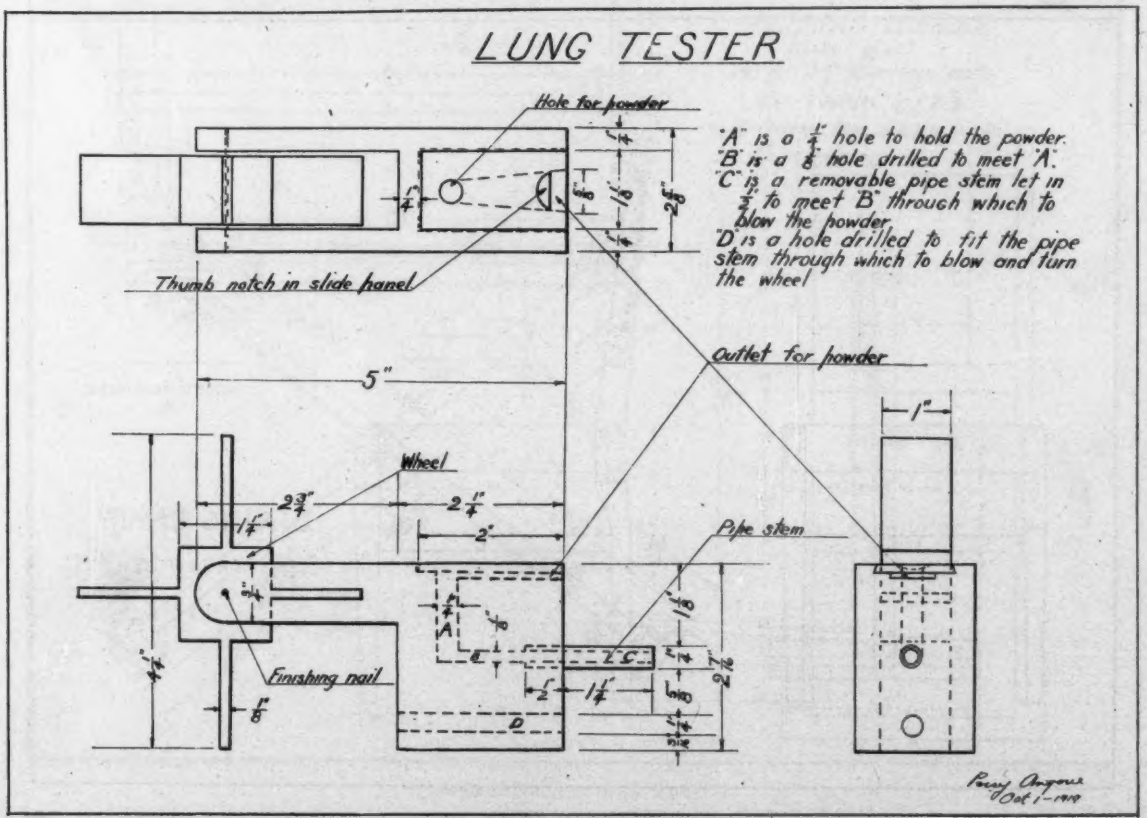
C. H. Oltman, High School, Berlin, N. H.

One of the most useful projects made in our shops is a paper cutter which holds various-sized rolls of drawing paper up to four and one-half feet.

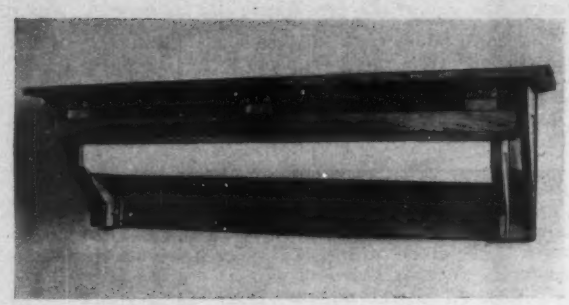
The plan was developed and the details were worked out in class. Students were assigned the making of separate parts after the plan had been decided upon.

Spring hinges, such as are used on screen doors, were put on to press the knife firmly against the roll. We ground and sharpened a piece of ⅛"x1¼" strap iron for the knife, and screwed it in place, as shown in the drawing. It required a little experimenting to locate the exact place to screw the hinges on so that the knife would swing against the roll as it diminished in size.

The top serves as a good shelf on which to place drawings that are in use.


LUNG TESTER
Hole for powder
"A" is a ¼" hole to hold the powder.
"B" is a ⅛ hole drilled to meet "A".
"C" is a removable pipe stem let in ¼ to meet "B" through which to blow the powder.
"D" is a hole drilled to fit the pipe stem through which to blow and turn the wheel
Thumb notch in slide panel
Outlet for powder
5"
1"
Wheel
Pipe stem
Finishing nail
Perry Angove
Oct 1-1919

DETAILS OF LUNG TESTER TOY.



PAPER HOLDER AND CUTTER.

CHIFFONIER.

F. W. Ziegenhagen, Instructor in Woodwork, Boys' Technical High School, Milwaukee, Wis.

The accompanying drawing and photograph illustrate a chiffonier that was designed by one of the author's students.

All the construction and details are shown in the drawing and only a few suggestions are offered. First of all the three ply panel may be eliminated, and in its place a solid panel, grooved into the legs, may be used. This helps the boy save time and to complete the problem in one semester.

The depth of the drawer may be altered to suit the individual without changing the designs. The drawer construction may be a dovetail-joint instead of tongue-and-groove joint.

The problem may be made of walnut, oak or mahogany and finished to suit.

BUFFET.

H. P. Gerber, Northern Normal and Industrial School, Aberdeen, South Dakota.

The Buffet, illustrated on page 37, is rather difficult problem in cabinet making and should not be attempted by any but second-year high school or advanced students of woodwork.

CHIFFONIER DESIGNED AND MADE IN MILWAUKEE TECHNICAL HIGH SCHOOL.

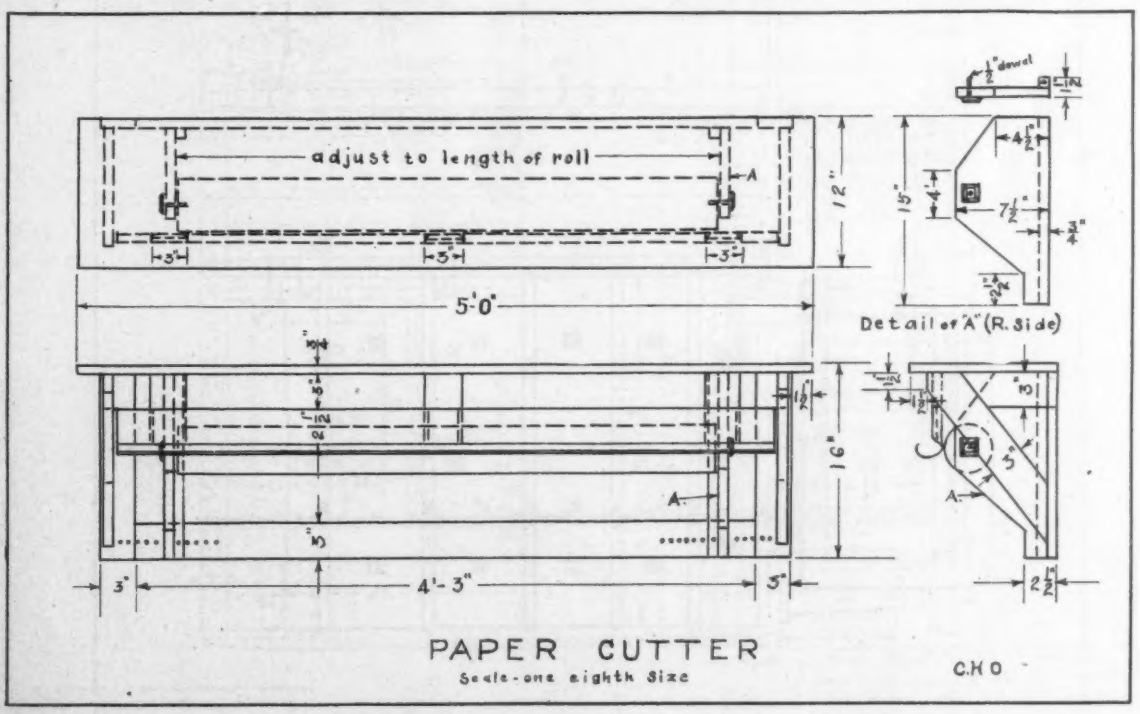
It comprises many and varied forms of construction and assembling such as panelled door construction and hanging; mirror frame; back, end, partition, and bottom panels; drawers; drawer supports; tier of drawers with one offset; inlaying.

Walnut inlay was used on this piece; finished in light fumed, shellaced and waxed.

THE SKIP JACK.

E. H. Colton, Amsterdam, N. Y.

One of the main essentials in shopwork is problems that the boys like to make and that give good use of dif-

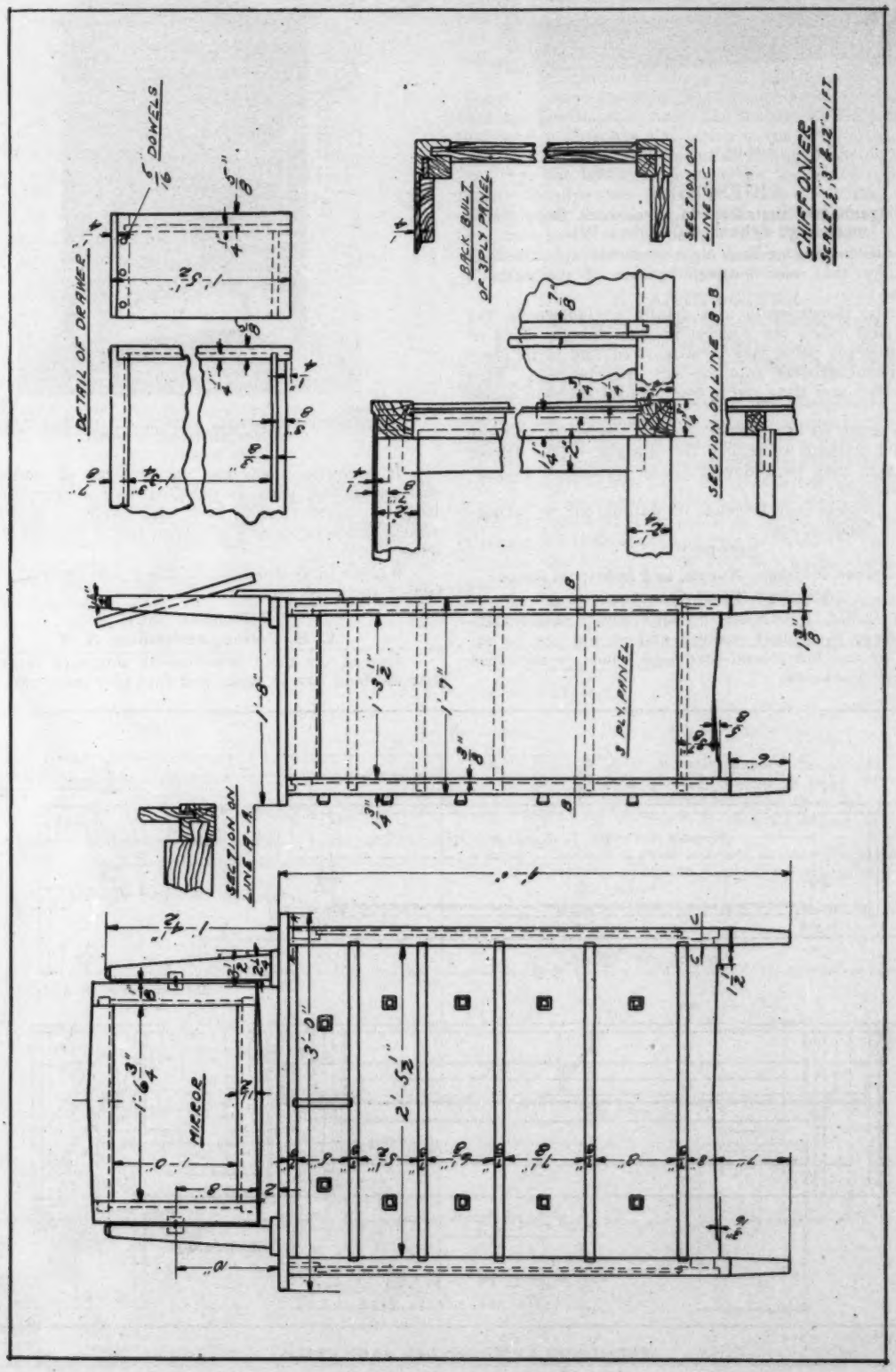


DETAILS OF PAPER HOLDER AND CUTTER.

ferent tools. The problem illustrated has proven very popular in our schools.

We find that the best material to use is ash for the runner and oak for seat, post and braces. If ash is not obtainable any straight grained wood may be used for the runner.

The runner is made first, using $\frac{7}{8}$" stock, 4"x48". Plane down to $3\frac{1}{2}$" wide. Lay back $23\frac{1}{2}$" from one end and square line; from this line, plane to a taper until it is $\frac{3}{4}$" thick at the front. The runner is then placed in a pail of hot water and allowed to boil two or three hours. After this place the runner on a form as shown in the photo-



See preceding Page.

graph. A piece of ash placed over the runner will often save it from being broken in bending. After the runner has thoroly dried take from form. Then lay out the curve on the front as shown in the drawing.

While the runner is drying to shape, the post is gotten out of 2¾"x2¾" stock. Cut to 14" long. Plane all four sides to 2½"x2½" square when finished. Cut square on one end and cut a 12° angle on the opposite end.

For the seat get out a piece ⅞"x9"x19". Surface to ⅞" thick and square up both edges so that seat is 8" wide. Cut off one end square, then make seat 18" long. Saw out notches for the hand holds as shown in the drawing.

Get out a piece for the braces, ¾"x4"x13". Surface to ⅝" thick and 3½" wide. Lay out cuts as shown in the drawing, cut the braces marked A. After the work is assembled place the bevel square between the post and runner and lay out the angle for the brace marked B with bevel square. These braces are screwed on with 1½" No. 12 flat head screws.

Sandpaper all pieces. Screw the runner to post as shown in drawing with five 2½" No. 14 flat head screws. The seat is aso fastened in the same manner. Next fasten the braces, and the sled is ready for finishing. Give two coats of shellac and one coat of spar varnish.

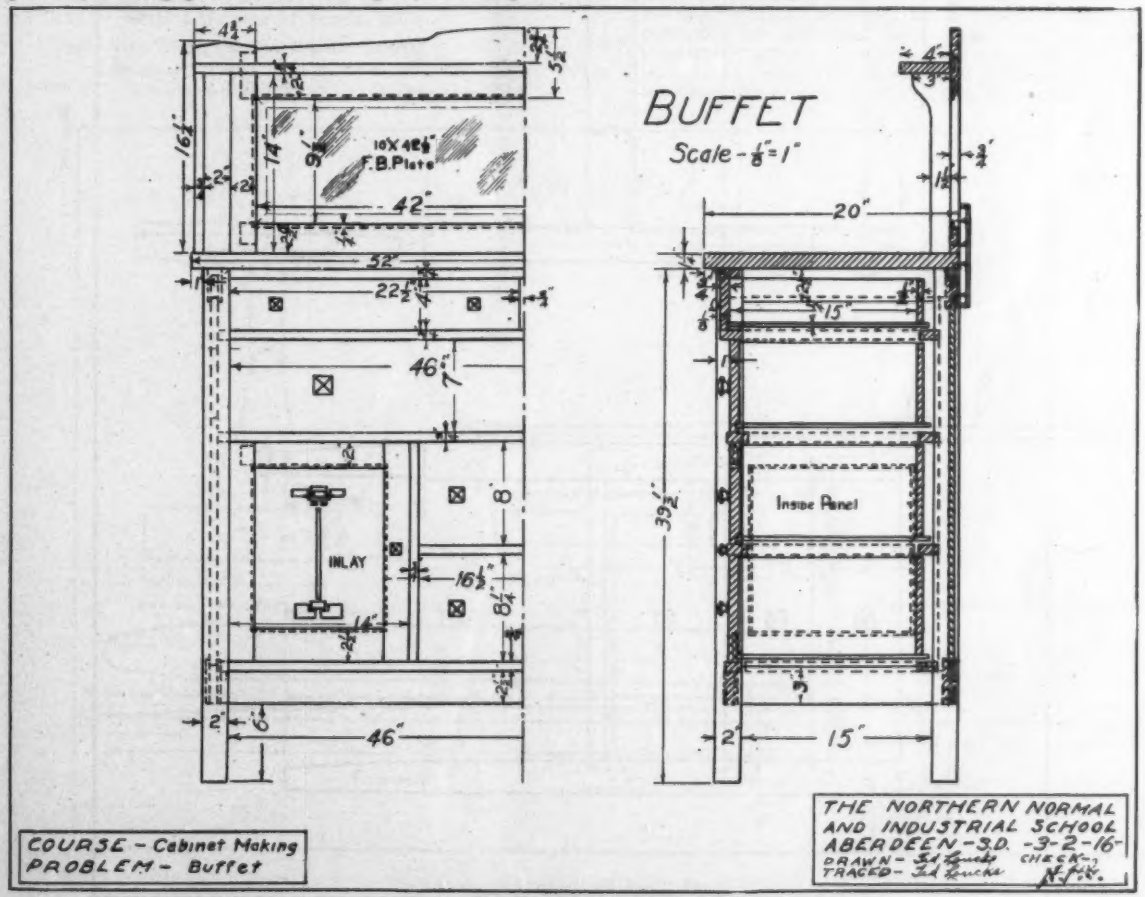
A SEWING STAND.

F. W. Ziegenhagen, Instructor in Woodwork, Boys' Technical High School, Milwaukee, Wis.

The accompanying problem illustrates an exercise in elementary cabinet making. The stand may be made of cypress, gum wood, or quarter sawed white oak — if he is capable of working it. In any case, it is well to let the boy make the stand in a softer kind of wood if he is not able to make a good job out of oak.

The problem may be made more simple by eliminating the side and back rails and panels, substituting a solid panel by cutting grooves into the legs and making it a tongue and groove problem. The detail of the drawer construction is shown in the drawing. A blind dovetail construction may be used instead. The finish depends upon the kind of wood used.

BUFFET DESIGNED AND MADE IN NORMAL SCHOOL, ABERDEEN, S. D.



DETAILS OF BUFFET.

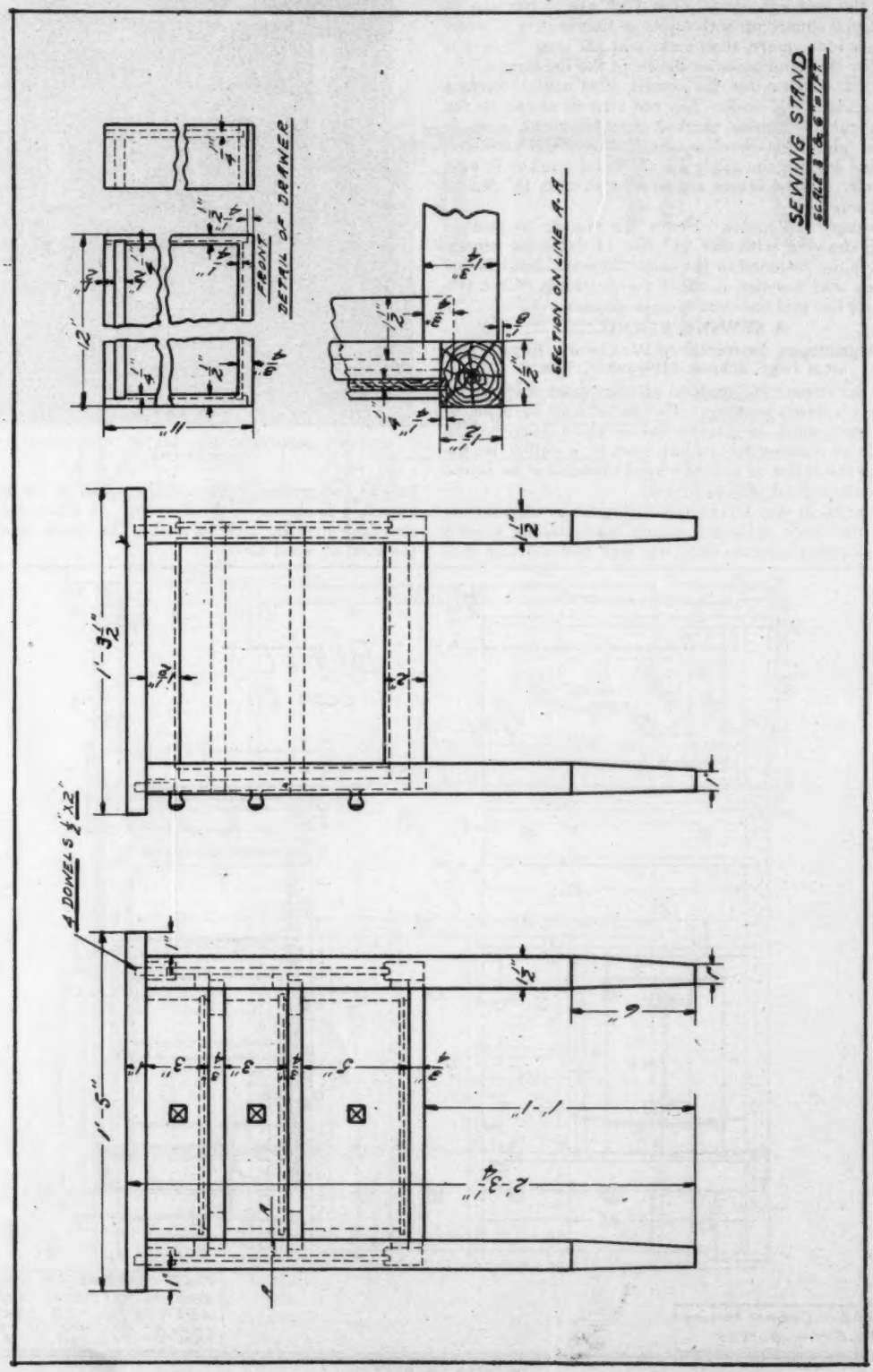
NEW BOOKS.

Principles and Methods of Industrial Education.

By William H. Dooley. Introduction by C. A. Prosser. Cloth, 257 pages. Price, $1.60. Houghton Mifflin Co., Boston.

In this volume, Mr. Dooley has rendered a genuine service to the teachers and the students of industrial education. He has clarified many of the vague spots in the matters of vocational teaching, courses of study, and the principle of psychology and pedagogy, by his simple, direct, discriminating statements.

This book, if properly read, should do much to dispel that common lack of understanding concerning the purposes, methods, and procedures in the field of industrial



See Page 37.

education. It will be a great help to prospective teachers who are now pursuing courses in preparation for the teaching of vocational subjects. Indeed, it would be well worth the time of the teachers of the academic subjects to read much, if not all, that Mr. Dooley has to say about the teaching process and the principles underlying the process of learning. It will find its way as a text into many classrooms, and it should be in every school library.

The Gary Public Schools.

Industrial Work. By Charles R. Richards. Paper, 204 pages. General Education Board, New York City.

Reports of the Gary plan have thus far been lacking in details and too often partisan in tone. This study was undertaken by the General Education Board at the request of the Gary school authorities and was made during three visits which together covered a total of four weeks. Facts gathered in a patient, painstaking way will be found in these studies. In an appendix of fifty pages, practical tests are given. For the benefit of the reader, the age, grade, previous training of each pupil is given.

The interest and enjoyment of these pupils in their work is conceded. The work often seemed narrow in scope, unsystematic and poorly supervised. In shops where repairs were made, the repairs crowded out proper instruction in processes or in the possibilities of the tools used. Yet it should be remembered the aim of the Gary plan is cultural, is not prevocational.

Blueprinting.

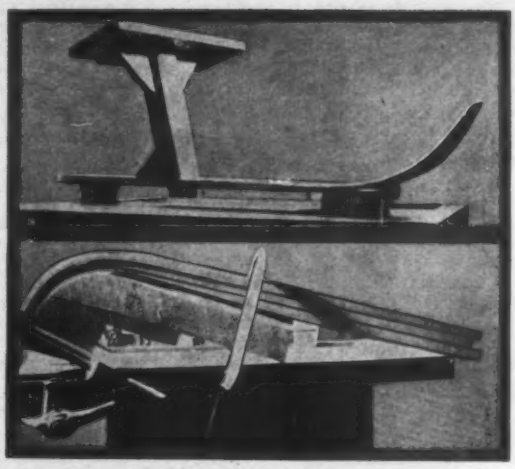
By John F. Friese. Cloth, 16mo, 56 pages. Price, $0.75. Manual Arts Press, Peoria, Ill.

Blueprinting as such is so easily done that it has been dismissed by technical writers with a few brief references. In the average drafting room and in the school shop where blueprinting is commonly done, there is consequently general ignorance of fundamental principles and materials.

The present book is an orderly presentation of printing room arrangement and equipment, the manufacture and nature of blueprint papers, the process of printing, and special printing. The author is an experienced blueprinter and he offers a number of helpful hints.

Industrial Work for the Middle Grades.

Edward F. Worst. Cloth, 9" x 12". 200 pages. Price, $3.50. The Bruce Publishing Co., Milwaukee, Wis.

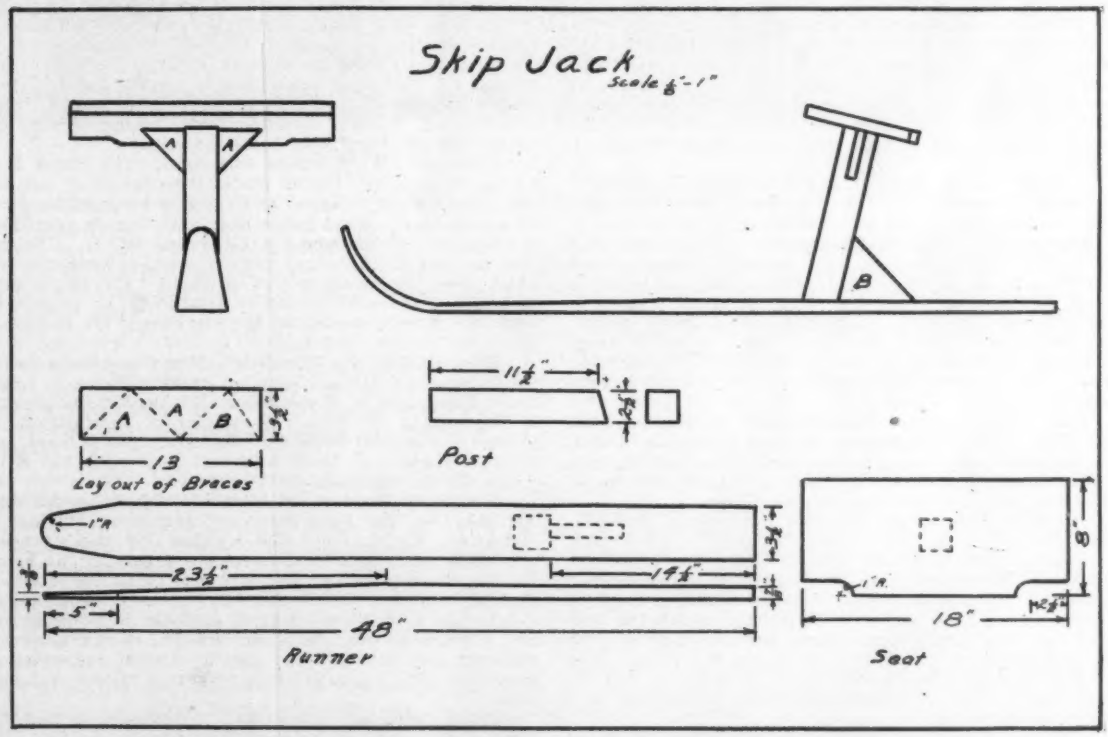


THE SKIP JACK. BELOW—FORM USED FOR BENDING.

The middle grades have suffered more than any others from the lack of proper handwork. The first three and the last three grades of the public school have received their full share of attention and have been provided with fairly satisfactory constructive work. But the fourth and fifth-grade handwork has been neglected.

Mr. Worst has admirably met the needs of these grades in his new book. He has put into attractive and usable form a great variety of interesting problems involving a large number of different materials such as thin wood, pine needles, ash splints, raffia, reed, willow, cement, paper, cardboard, book cloth, clay, etc.

This volume of more than 200 very large pages contains chapters on coping saw work, all forms of basketry, bookbinding, Portland and magnesite cement work, etc. The directions are fully and clearly given, and the designs are excellently adapted to the grades for which they are intended. In some of the lines of work, like coping saw work, the drawings are made the full size of the models.



DETAILS OF SKIP JACK.

The book is so rich in problems and suggestions that it furnishes material that may be used thruout the sixth, seventh, and eighth grades, especially where woodworking shops are not provided. In contains as much material as may ordinarily be found in a number of volumes. Every teacher, especially of the intermediate grades, should at least have access to this book.

Alexander's Offset Measurement Table.

By D. A. Alexander, M. E. Leather, 3½" x 5". Price, $1. Published by the author at Rochester, N. Y.

This little book presents the measurement of 450 offset lines between parallels from one-eighth inch to 21 feet. The tables are especially valuable to engineers and draftsmen who deal with pipe systems for heating, plumbing, sprinkler and refrigerating and electric conduit systems. The book has the merit of accuracy and instant reference.

NEW BOOKS AND PAMPHLETS.

Directed Observation of Teaching. By D. J. MacDonald, professor of vocational education, University of Cincinnati. Printed by the U. T. A. School of Printing, Indianapolis, Ind. This little pamphlet of thirteen pages points out the advantages to be gained in practice teaching thru directed observation. It discusses teachers' objectives, classroom conditions, suitability of subject matter, nature and arrangement of equipment, management of the class, assistance to pupils, marking pupils, and the conduct of tests and examinations. A list of references on teaching methods is included.

A Report on the Work of the Educational Department of General Hospital No. 2, Fort McHenry, Md. The pamphlet was prepared by the patients in the shops and classes of the educational department and the printing was done by the Fort McHenry Press. The pamphlet describes and illustrates work in the woodworking shop, automobile school, vulcanizing shop, shoe shop, print shop, electric shop, photography shop, telegraphy school, radio course, commercial art class, show-card class, jewelry shop, mechanical drafting school, commercial school, typewriting school, civil service school, agriculture and ward occupations.

Bulletin of the Metropolitan Museum of Art, New York City, Sept., 1919. The bulletin contains a number of articles for school use, namely, The Place of the Art Museum in Elementary Education, The Place of the Art Museum in Education, and Art Museums and the Shops.

Dental Mechanics as a Vocation. Vocational Rehabilitation Series No. 41, Aug., 1919. Prepared by Dr. Harold D. Cross and issued by the Federal Board for Vocational Education, Washington. In this pamphlet, attention has been given to qualifications of the worker and to the type of work done. With proper qualifications, mechanical dentistry may offer large returns upon the investment of time and effort required to complete this course of training. The pamphlet discusses hours and wages, permanency and opportunities of the profession, qualifications, training, and courses of instruction.

Baking. Vocational Rehabilitation Series 43, Aug., 1919. Prepared by J. A. LeClerc, and issued by the Federal Board for Vocational Education, Washington. The pamphlet discusses the business of baking, the number of persons engaged in this occupation, the value of bakery products, working conditions, training and experience, and qualifications of the worker.

How Teachers May Use Publications on the Control of Diseases and Insect Enemies of the Home Garden. By Alvin Dille. Department Circular 68, Sept., 1919, U. S. Department of Agriculture, Washington. Discusses crop pests and diseases, illustrative material, practical exercises and correlations.

How Teachers May Use Farmers' Bulletin 876, Making Butter on the Farm. By E. H. Shinn. Department Circular 69, Sept., 1919. U. S. Department of Agriculture, Washington. Discusses the quality and preparation of cream, process of churning, washing, salting and working butter, making up of packages, and equipment for farm buttermaking.

Catalog of the Industrial Teacher-Training Department, Oswego State Normal and Training School, Oswego, N. Y.

Books Made by First Four Grades of the Training Schools, Northern Illinois State Normal School, De Kalb, and sent to the Chicago Commons.

Thrift in the Household. J. H. Puelicher, State Director of Wisconsin War Savings' Organization, Milwaukee, Wis. Published by the War Savings Organization, U. S. Treasury Dept., Seventh Federal Reserve District. This booklet of twelve pages contains suggestive budgets, also home record sheets for the balance of the year 1919. It discusses family budgets, distribution of income to meet expenses, and the keeping of home accounts.

Scientific Food Selection Simplified. The Home Economics Department, United States Department of Agriculture, Washington. A series of six charts designed for popular use by teachers and lecturers in applying the principles of scientific food selection for the average family. The tabulations have been planned to show unchanging factors on which wise food selection may be based. The charts may be easily reproduced in either temporary or permanent form and may be copied on the blackboard for classroom use.

Home Making in Wisconsin. Home economics teachers exchange of ideas. Compiled by Miss Helen C. Goodspeed, Supervisor of Home Economics, Department of Public Instruction, Madison. A circular of information, in which are discussed important topics, successful plans and valuable suggestions for co-workers. A question box is included for the benefit of the teachers.

Household Weights and Measures. Miscellaneous Publications, No. 39, Department of Commerce, Bureau of Standards, Washington. The weights and measures are printed in card form for convenience in use in the home. On the obverse side of the card are found the common kitchen measures, liquid and dry measures, avoirdupois weight and approximate weights of common dry commodities. On the reverse are linear measure, square and cubic measure, the international metric system, approximate weights of common materials and common rules of measurement.

Brood Coops and Appliances. A contribution from the Bureau of Animal Industry and Animal Husbandry Division at Washington. Circular No. 13, U. S. Department of

A COMMUNITY PROJECT

A. A. Upham, State Normal School, Whitewater, Wis.

The following project was carried out by the first-year high school boys of the Whitewater (Wisconsin) normal school. The work was begun in the fall of 1918 and completed about March, 1919. It consisted in making, painting, and lettering something over two hundred street signs. The job was suggested by the mayor, and the city cooperated by paying for the material, a matter of about twenty dollars.

The boys at the time of starting the project were having the subject of lettering in connection with mechanical drawing and so the chief change from the prescribed course consisted in the study of letters of a larger size than would naturally be used on drawings. The lettering was done by the aid of stencils cut out of stencil paper.

Among the advantages of this project may be mentioned the fact that the boys were interested in a community project; that they had a chance to see some work done more or less under shop conditions, i. e., with division of labor; that they had considerable practice in planning up the "fundamental block," a piece to dimensions, in which most projects consist; they learned pretty thoroly one style of lettering; they learned, with some astonishment, that a stencil can be cut thru stencil paper against a glass plate without spoiling a knife; and lastly that much repetition leads to considerable skill.

The project brought out the fact that several of the boys have latent talent as sign painters and letterers which has since been used commercially.

A GROUP AT WORK.

SIGNS IN POSITION.

The letters were plain Roman block letters without serifs, the idea being that a plain job well done is better than a fancy one botched. The letters were marked out, sometimes by the aid of a pattern, and sometimes by the knowledge of the pupil, and cut with sloyd knives, cutting thru on to a pane of glass.

After the stencils were cut the boys went into the shop where the signs were ripped out of choice seven-eighth inch pine. The signs when ready to paint measured 18"x3¼"x-15" to 22", depending in length on the name to be printed. Before lettering, the signs received two or three coats of white lead paint.

The stencils were not used with a short bristle brush dabbing thru, as is generally done, but by marking around with a fine pencil and then laying on good carriage paint with small brushes. In this way the daub on the back of the stencil was avoided.

The marking and cutting of the stencils was done by all the boys working together, the painting by four or five working in relays and the lettering was also done by a half dozen or so working together. As the only available place free from dust for this lettering was the physical laboratory three and a half stories above the shop in another building, it will be seen that a good deal of work was done without close supervision.

SEEKS COOPERATION IN VOCATIONAL GUIDANCE.

How state or city school authorities may take the initiative in arranging for cooperation with the United States Employment Service in the establishment of guidance and placement departments is described by Mrs. Anna Y. Reed, of the junior section of the Employment Service, in a series of circulars sent to counselors and school-guidance workers thruout the United States.

The junior section, Mrs. Reed points out, was instituted primarily for the purpose of helping every youth in the Nation to "find himself occupationally." Its main function is therefore vocational guidance in selecting occupations. Much of the work of the national office in the future, according to Mrs. Reed, will consist of the collection and dissemination of occupational information in such a way that analysis of the sources of labor supply and demand, information as to job specification, terminology, statistical records, etc., may be uniform in value and open to national interpretation.

Plan of Organization in the Local Community.

When it has been decided to establish a junior section of the United States Employment Service, organization procedure is as follows:

1. A superintendent of junior guidance and placement is appointed to study the supply of, and demand

for, boy and girl workers under 21 years of age, and to recommend a plan for organization and administration of a junior department which will meet community needs and contribute to the solution of community educational and vocational problems.

(a) Such superintendent must be appointed jointly by the board of education and the United States Employment Service.

(b) Local men familiar with local industries and educational agencies are usually preferred.

(c) Educational men with experience only in academic lines are rarely indorsed by the junior section of the Employment Service.

(d) Salaries may be paid entirely or in part by the Federal Government, or, as is the case when the superintendent is already an associate superintendent of schools, it may be paid entirely by the board of education. In such cases the government usually pays the salary of the assistant.

(e) As a Federal employee the superintendent of junior guidance and placement is privileged to use the mailing and the telegraph frank for all business in connection with his office.

Cooperation With School Attendance Department.

2. It is essential that the plan submitted to the national office provide for—

(a) Centralization of all public junior placement activities under one superintendent.

(b) Cooperation with all private social agencies doing placement work or contributing in any other form to the welfare of boys and girls.

(c) Cooperation with employment managers.

(d) Control, direction, or cooperation with the school attendance department in such a way that the problem of school elimination may be more successfully studied and labor turnover may be checked at the start. A modern director of school attendance is usually a far better superintendent of junior placement than is a school principal. In Philadelphia the director of school attendance is superintendent of junior placement for the United States Employment Service.

In some cities it has been necessary to refuse to federalize school departments because of the old type of police officer at the head of the attendance work.

(e) Definite plans whereby the returns on vocational placement may be used by classroom teachers for purposes of guidance and by school board for organizing or reorganizing academic and vocational curricula.

3. Superintendents of placement are free to recommend any plan which seems to them to be desirable locally. If trained placement workers are already employed on part time, it may be wise to suggest that Federal funds be used to supplement their salaries and assign them to full-time work. Eight of the largest cities east of Chicago have installed, or are installing, junior sections of the United States Employment Service, in cooperation with boards of education.

MOVABLE SHOPS FOR SUBURBAN SCHOOLS.

School boards often find it difficult to provide equipment and teachers for the shopwork demanded in rural districts, especially if the districts are thickly populated and the schools numerous. The school board of Los Angeles, Cal., has solved the problem of providing shopwork in ten or twelve small elementary schools in the San Fernando Valley, an agricultural community now a part of the Los Angeles School District.

The shop consists of an automobile truck, upon which is mounted full equipment for work in forging, grinding, drilling, carpentry, soldering and repairing of tools and supplies. The truck visits every school one-half day a week. The boys await the traveling shop with enthusiasm and much splendid work has been done the past year. The man in charge of the traveling shop has had wide experience in repair work and has had a good deal of training in blacksmithing and building.

A course in farm mechanics, including carpentry, blacksmithing, soldering, tool sharpening, plumbing, cement work and repair of farm machinery, is offered to older boys.

CASES BUILT FOR PHYSICS DEPARTMENT, CIRCLEVILLE, O., HIGH SCHOOL.

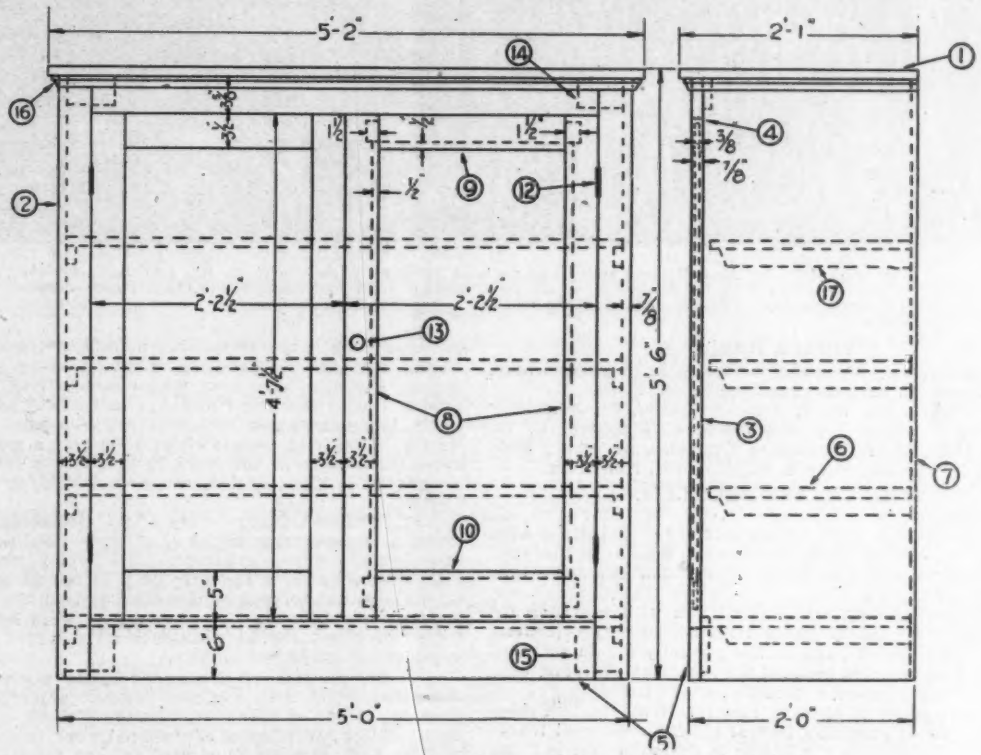
The cabinet, illustrated above, was made as a class project by the manual-arts class of the Circleville, O., high school, under the direction of Mr. C. F. Zaenglein. From the first sketches to the final finishing, the entire work was done by students. A member of the mechanical drawing class made the drawings and a group under a student foreman did the work of construction, installation and finishing. The instructor acted as guide. The cabinet affords a saving of more than a hundred dollars to the board of education.

NOW, ARE THERE ANY QUESTIONS?

This department is intended for subscribers who have problems which trouble them. The editors will reply to questions, which they feel they can answer, and to other questions they will obtain replies from competent authorities. Letters must invariably be signed with full name of inquirer. All questions are numbered in the order of their receipt. If an answer is desired by mail, a stamped envelope should be enclosed. The privilege of printing any reply is reserved. Address, Industrial-Arts Magazine, Milwaukee, Wis.

Supply Cabinet.

976. Q:—Can you furnish me a drawing and bill of materials for a Red Cross supply cabinet? I am interested from the standpoint of making such a cabinet for storing goods, yarns and other materials used in a sewing room.—*B. C.*



DETAILS OF RED CROSS SUPPLY CABINET.

A:—A working drawing of the Red Cross Supply Cabinet made by the Junior Department in 1918 is reproduced on this page. The figures in the circles refer to the item numbers in the following bill of materials:

Item	Name	Size	Req.
1	Top	⅞"x25"x5'2"	1
2	Side	⅞"x23⅛"x5'5⅛"	2
3	Front Trim Side	⅞"x3½"x5'5⅛"	2
4	Front Trim Top	⅞"x3⅝"x4'5"	1
5	Front Trim Bottom	⅞"x6"x4'5"	1
6	Shelf	⅞"x23"x4'10¼"	4
7	Back (Compo Board)	4'11"x5'5⅛"	1
8	Door Stiles	⅞"x3½"x4'7½"	4
9	Door Top Rail	⅞"x3½"x1'10½"	2
10	Door Bottom Rail	⅞"x5"x1'10½"	2
11	Door Panel	⅜"x20½"x4'½"	2
12	Hinge	3" Loose Pin Butt	2 pair
13	Corbin Cylinder Lock		1
14	Block	¾"x3½"x6½"	2
15	Block	¾"x5"x6½"	2
16	Moulding	¾"x1½"x9'6"	
17	Battens	¾"x3"x22½"	8

The cabinet may be made of any desired stock to match the furniture in the room where it is to be used. The Red Cross cabinets were made of pine or poplar and were of solid construction, either glued up stock or tongued and grooved, beaded stock. The doors may be panelled, according to the maker's taste. The drawing indicates the simplest possible single panels, with mortised and tenoned, glued frame. The door must be made to fit snugly and to hang properly.

The door is hung on 3-inch loose pin butt hinges and is fitted with a spring catch and a small cylinder lock.

The case may be finished as desired. For the soft woods enumerated above, it may be stained and then given one coat of shellac and two coats of varnish.

Farm Arithmetics.

3. Q:—I should like a farm arithmetic for first-year high school boys, one that would have considerable work in feed rations for cattle; estimating value of farm property; farm accounts; household accounts; farm fertilizers, etc.—*E. P. VL.*

A:—The following is a list of books on farm arithmetic: *Farm Business Arithmetic*, C. J. Lewis, D. C. Heath, Boston; *Agricultural Arithmetic*, G. C. Schutts & W. W. Weir, $0.80, Webb Publishing Co., St. Paul; *Agricultural Arithmetic*, Stratton & Remick, $0.50, Webb Publishing Co., St. Paul; *Farm Arithmetic*, C. W. Burkett & K. D. Swartzel, $1, Munn & Co., New York; *Mathematics for Agricultural Students*, H. C. Wolff, $1.50, Guy M. Jones Co., Indianapolis, Ind.

Books on Tool Work.

4. Q:—Can you tell me where I can get a good book on Tool Design and on punch and die work?—*G. F. P.*

A:—The following books will be helpful to you in a study on tool design and punch and die work: *Practical Die Making*, F. H. Colvin, $2, McGraw-Hill Book Co., New York; *Die Making and Die Design*, F. D. Jones, $2.50, Industrial Press, New York; *Dies: Construction and Use*, J. V. Woodworth, $3, N. W. Henley, New York; *Punches, Dies and Tools*, J. V. Woodworth, $4, N. W. Henley, New York; *American Machinist's Handbook*, Colvin and Stanley, $3, McGraw-Hill Book Co., New York; *Drop Forging, Die Sinking and Machine Forming of Steel*, J. V. Woodworth, $2.50, Guy M. Jones Company, Indianapolis, Ind.

Toy work done by the individual and group methods by boys in the De Kalb, Ill., schools, under the direction of Mr. Milo T. Oakland, assistant in the Department of Industrial Education in the Northern Illinois State Normal School. Both the new and the repaired toys were distributed among the needy children of De Kalb.

Harness Repair.

5. Q:—Kindly give me information as to where I may obtain a book on harness repair work.—*H. P. G.*

A:—*Farm Shop Work*, Brace & Mayne, $1, American Book Co., Chicago, Ill.; *Mending and Repairing*, C. G. Leland, $1.50, Webb Publishing Company, St. Paul; *Saddlery*, P. N. Haslock, Funk & Wagnalls Co., New York.

THE SALARY PROBLEM.

To the Editors:

An editorial in your October number of Industrial-Arts Magazine sounds the keynote of what should be the vast concert of harmonies in every educational magazine this and next year.

"Other Compensations" was written with a keener appreciation of the salary problem than is usually evidenced by those who merely harp on the necessity for an increase in the pay of teachers because the high cost of living, etc., is hard on the instructor in these parlous times.

Another phase of editorial matter: Why create a class consciousness of providing federal aid for vocational teachers and neglecting the vast group in the older system? As tho these latter were of less importance to the welfare of society! Vocational teachers receive nearly double the salaries of the others, and deserve less from the point of view of efficiency and preparation. That is—if comparison is made as to relative ability. We have both kinds here—and I have studied the situation for years.

Atlantic City, N. J. *Jos. Weintrob.*

BOSTON MANUAL TRAINING CLUB.

The Boston Manual Training Club held its first meeting for the season on Saturday, October 18, at the Wentworth Institute. Reports of the various committees, including the program, positions, press committees, and the house committee of the Manual Training Camp were presented. The last was the most interesting, because the committee reported the sale of the camp which the club has owned for some years.

The speakers were Mr. George C. Greener, who talked on Activities of the Federal Board for Vocational Education, and Mr. Arthur L. Williston, who spoke on The Rehabilitation of the Disabled Soldier From the Standpoint of the Schools.

Mr. Greener's talk was most interesting, and went a long way with his hearers in helping them to a clearer idea of the work the Federal Board is doing with disabled men. He told of the difficulties involved in training with over eight hundred trades represented among the men, and schools equipped to give training in about sixteen. It has been necessary to go to industry for "training on the job", a very important part of the work which is now being developed.

In answering some criticisms, Mr. Greener pointed out that as it takes from nine months to four years to train a man to be a good tradesman, it is not surprising that so few men have been placed in positions up to the present time. The board now has in training 14,000 men, which is fourteen per cent of those who need it. It is placing in training schools about 5,000 men a month. The great significance of the work is that it has led the way to industrial rehabilitation, the need for which is always present.

Mr. Williston gave a study of the psychology of vocational treatment and training of men. He pointed out that because of the experience thru which the disabled man is passing, it is the first duty of the school as well as the hospital to restore the man to health. It is also important to keep up the standard of work because the output of these men as workers must measure up to the standards required by industry.

At the meeting on November 7, the members, after the usual social time and good dinner, adjourned to the assembly room at the Continuation School, where Mr. Huger Elliott, Director of educational work in the Museum of Fine Arts, gave an illustrated talk on "Taste and Common Sense."

Mr. Elliott showed by his pictures and his lecture how design should follow structure and how common sense is frequently violated when the designers depart therefrom. Good examples of design in jewelry, furniture, decorative windows, etc., were shown accompanied by explanation which was instructive, entertaining, and most pleasingly given.—*Edward C. Emerson.*

Meeting of the Essex County Arts Association.

The Essex County Arts Association held a number of sectional meetings during the period from November 5th to 20th. The Fine Arts Section which was held at the Girls' Industrial School, Newark, was in charge of Miss Ora Strange. The Industrial Arts Section was conducted at the East Orange High School and was in charge of Mr. Ernest W. Tuttle. Miss Bessie M. Crisman was chairman of the Household Arts Section which was held at the Columbia School at South Orange. The Vocational Section which was held at the Girls' Vocational School, Newark, was conducted by Mr. James E. Dugan.

The association elected the following as its officers:

President, Eva E. Struble; Vice-President, Phillip M. Wagner; Secretary-Treasurer, Edwin F. Judd.

The Art Alliance of America held on October 23rd to November 1st an exhibition of textile designs for dress silks, cotton and ribbons. Prizes amounting to $2,100 were awarded. The first prize for Dress Silk went to Mr. Zoltan Hecht. The first prize for Dress Cotton went to Miss Nell Witters and for Ribbons to Mr. Zoltan Hecht; for Decorative Silk to Miss Hazel B. Slaughter.